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TROPICAL DISEASES BULLETIN

Vol. 5. 1915. No. 1.

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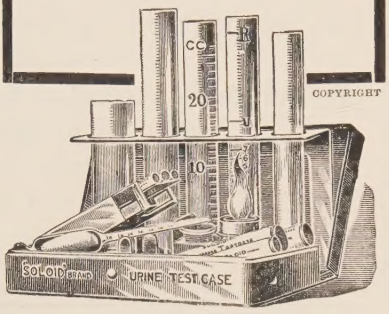

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TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 5.] 1915. [No. 1.

TROPICAL SKIN DISEASES.

CHALMERS (Albert J.) & MARSHALL (Alexander). **The Systemic Position of the Genus *Tricophyton* [*Trichophyton*] Malmsten, 1845.** *Jl. Trop. Med. & Hyg.* 1914. Oct. 1. Vol. 17. No. 19. pp. 289–291. With 5 figs.

The authors state that, as a rule, no mention of the genus *Trichophyton* is to be found in the larger works on fungi or, if it is found, it is used only as a synonym. They therefore go into the history of the subject and refer to a *Trichophyton* discovered by themselves as a common cause of ringworm of the head of school boys in Khartoum and Omdurman [see p. 3.] The conclusions reached are:—"That the genus *Trichophyton* Malmsten, 1845, belongs to the family *Gymnoascaceae* Baranetzky, 1872, which is included in either Brefeld's *Hemiascomycetes* or De Bary's *Ascomycetes*, according to the form of classification adopted by the reader."

[The paper is a somewhat technical one and should, therefore, be consulted in the original by those interested in the subject.]

G. C. L.

BRAULT (J.) & VIGUIER (A.). **Kérion dû au *Trichophyton granulosum* observé à Alger.**—*Bull. Soc. Française de Dermatol. et Syph.* 1914. Apr. Vol. 25. No. 4. pp. 207–210. With 1 text fig.

The condition was seen in a child aged eleven. Though its parents were Italians the child had been born in Algiers and had always lived there. On the left parieto-occipital region there was a lesion having a typical kerion appearance. It was of a light red colour, of orbicular shape and was four to five centimetres in height with a breadth of little less. The surface was cribriform in appearance and light pressure caused much pus to exude. Cultures were eventually made from the lesion and it was found that a fungus was responsible, this giving the characteristic cultural diagnosis of *Trichophyton granulosum*. A specimen of the culture was sent to SABOURAUD, who confirmed this diagnosis.

G. C. L.

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Brault (J.) & Viguier (A.). **Note sur une Nouvelle Espèce de Trichophyton à Culture Faviforme isolée à Alger.**—*Compt. Rend. Soc. Biol.* 1914. July 17. Vol. 77. No. 25. pp. 342–343.

In two children born in Algiers, and who had always lived there, the authors observed two typical kerions due to a new species of Trichophyton, giving a faviform appearance in cultures. They place the new fungus in the faviform group, because of its disposition in the hairs, which shows that it is a megalosporon ectothrix, and also on account of its characteristic appearance in cultures. As the organism did not conform to any of the known species of the faviform group cultures were sent to Sabouraud, who stated that it was a new species. The authors propose therefore to study it in greater detail, and because its development is more rapid than that of other known species they give it the name of *Trichophyton luxurians.*

G. C. L.

Brault (J.) & Viguier (A.). **Les Champignons des Teignes à Alger.** *Bull. Soc. Path. Exot.* 1914. July. Vol. 7. No. 7. pp. 554–556.

In the last two years at the dermatological clinic at the hospital of Mustapha the authors have made a complete systematic study of certain ringworms. The results of their researches, as regards the scalp, were as follows :—

Trichophytons endothrix.—*T. acuminatum,* 8 cases ; *T. violaceum,* 4 cases ; *T. crateriforme,* 2 cases ; Trichophyton having the appearance of *T. polygonum,* 1 case.

Trichophytons ectothrix.—*T. granulosum,* 1 case ; and a new species showing a faviform culture to which the name of *T. luxurians* was given (see above).

Of skin ringworms *T. acuminatum* was met with. Epidermophytons were seen in fifteen cases and twenty-three cases of favus of the scalp were noted. The authors propose to give the name of *Achorion quinckeanum* to the parasite causing the latter disease in Algiers.

G. C. L.

De Napoli (Ferdinando). **Le Tigne nell'Oasi di Tripoli e la Cura dei Tignosi in Libia.** [Ringworm in the Oasis of Tripoli and the Cure of Ringworms in Lybia.]—*Giorn. d. Med. Militare.* 1914. July 31. Vol. 62. No. 7. pp. 611–624. With 1 plate.

Affections by various tineas are common in the oasis of Tripoli, occurring in the forms of endemics or epidemics and not in isolated sporadic cases or isolated foci. The following is a list, in order of frequency, of parasites isolated by the author :—*Achorion Schönleinii* 37 times ; *Trichophyton cerebriforme,* 16 times ; *T. violaceum,* 11 times ; *T. plicatile,* 9 times ; *T. acuminatum,* 3 times ; *T. crateriforme,* 2 times ; *T. regulare,* once ; *T. faviforme,* once. A detailed description is given of these different forms.

The author believes that modern treatment offers a secure and absolute means against trichophytons and that favus also responds well to local medical measures. Chief amongst physical means come X-rays, and in the author's hands radio-therapy has given good

results, bringing about depilation in a very short time. Where depilation is not complete the remaining hair should be removed by forceps. In other instances cases were treated by means of adhesive plasters and by applications of tincture of iodine or of chrysarobine ointment. Radiotherapy, however, offers the best means of cure. This method, according to the author, has in Paris produced an annual economy of 400,000 lira. Though not feasible in all instances in out of the way places such as Lybia, still he hopes that it may be employed where possible.

G. C. L.

CHALMERS (Albert J.) & MARSHALL (Alexander). **Tinea Capitis Tropicalis in the Anglo-Egyptian Sudan.**—*Jl. Trop. Med. & Hyg.* 1914. Sept. 1. Vol. 17. No. 17. pp. 257–265. With 2 plates and 1 text-fig.

So far as the authors are aware no researches have hitherto been made to differentiate the form of Tinea capitis tropicalis found in the Anglo-Egyptian Sudan. They state that up to the present they have found only one species of the genus Trichophyton which appears to differ somewhat from those usually described.

The history of ringworm in the Tropics is described and a list of the fungi at present recognised to be the causal agents of Tinea capitis tropicalis is given.

This is as follows :

"Genus *Microsporum*, Gruby, 1843.

" (1) *M. audouini* Gruby 1843, found in Brazil, Senegal, the Western Sudan and Madagascar.
" (2) *M. fulvum* Uriburu 1907, found in the Argentine.

Genus Trichophyton Malmsten 1848.

" (1) *T. circonvolutum* Sabouraud 1909, found in Senegal and Dahomey.
" (2) *T. exsiccatum* Uriburu 1909, found in the Argentine.
" (3) *T. polygonum* Uriburu 1909, found in the Argentine.
" (4) *T. sabouraudi* R. Blanchard 1895, found in Brazil.
" (5) *T. soudanense* Joyeux 1912, found in the Western Sudan.
" (6) *T. violaceum* Bodin 1902, found in North Africa.
" (7) *T. violaceum* varietas *decalvans* Castellani 1905, found in Ceylon."

The variety of tinea found by the writers was observed in Omdurman and Khartoum in Sudanese boys and youths about ten to sixteen years of age. The infected persons showed one or more white patches upon their heads, composed of white scales, of normal hairs and of hairs broken off about a millimetre above the surface of the skin. Such broken hairs when removed and soaked in forty per cent. caustic potash for some hours show very distinctly rows of spores inside the shaft of the hair, though none are to be seen in the sheath or cortex. Pure cultures were obtained and it was found that the trichophyton grew well aerobically at 20° and 34° C. and quickly at 37°, but not so well at 40°. Anaerobically no growth took place. Various media were employed. A list of these is given together with the characteristic growths seen. As regards animal inoculations, negative results were obtained with inoculations direct from a patient's head into a monkey, a cat, a dog and a white mouse, and also with inoculations of cultures into another series of animals of the same species.

For reasons which the authors hope to deal with in another paper they conclude that "this fungus belongs to the class of *Fungaceae* of Linnaeus, called *Ascomycetes* by DE BARY, which includes BREFELD'S hemi-ascomycetes, unless this is taken as a separate division, in which case the fungus in question would belong to this division. It also belongs to the family *Gymnoascaceae* Zopf, 1885, and to the genus *Trichophyton* Malmsten 1848, which MATRUCHOT and DASSONVILLE have already demonstrated to belong to this family. It comes under MALMSTEN'S genus Trichophyton because :—

"(1) It is parasitic in hairs and in the skin.

"(2) Its hyphal segments (so-called spores) are large, 4·5μ in diameter.

"(3) In cultures it possesses conidia on short conidiophores.

"(4) It possesses spirally curved hyphae.

"It belongs to the division of the genus Trichophyton called Endothrix because it develops solely in the interior of the hair and does not cause suppuration."

Alopecial patches are usually small and not noticeable, and the prognosis as regards baldness appears to be good.

A variety of remedies was tried, tobacco soap being found the most useful. The disease apparently spreads but slowly, so periodical inspections of all scholars and a prompt treatment of such cases should do much to prevent its incidence. A series of plates is given showing the appearance of the lesions on the scalp and also the characteristic growths in the different cultural media. The name *Trichophyton currii* is proposed.

G. C. L.

McMURTRIE (K.). **A Case of Mycetoma (Madura Foot) in the Transkei.** —*S. African Med. Record.* 1914. May 23. Vol. 12. No. 10. p. 164.

A native woman, aged 62, was recently seen by the author with a swelling about two inches in circumference on the dorsum of the left foot. There were several sinuses in connection with this, but no bone could be felt on probing, and there was very little discharge. The swelling and sinuses were said to have existed for about five years, but there had been very little pain, the patient still being able to walk on the foot. The popliteal and femoral glands were not appreciably enlarged. The condition suggested the possible presence of a foreign body, but there was no history to support this view, and probing was also negative.

The swelling was explored under an anaesthetic, and it was found that the interior consisted of a multilocular cavity filled with firm black granules roughly cubical in shape, somewhat resembling charred match heads. Some of these were sent to the Government Laboratory for a microscopical diagnosis and fungi arranged in radial masses like actinomyces clumps were found. The diagnosis was therefore one of the black variety of mycetoma (Madura foot).

G. C. L.

RUDOLPH (Max). **Ueber die brasilianische "Figueira."**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. July. Vol. 18. No. 14. p. 498.

Brazilian Figueira resembles closely blastomycosis. The condition occurs in the States of Minas Geraes and Goyaz, where an apparently similar condition is seen in cattle. In man the disease begins as a small wart-like growth on the back of the foot, which in the course of

years develops into a cauliflower-like papilloma, the lymphatic system eventually becoming implicated. Some physicians believe the condition is a hypertrophic lupus, others a skin cancroid.

The author, however, isolated an apparently identical blastomycete from four out of six of his cases. On artificial media the organism develops as a dark brown to black growth ; it grows especially well on Sabouraud's medium. Though it cannot be definitely said that the disease of cattle is the same as that of men, yet most of the patients were from the country and had been in contact with cattle suffering from Figueira. G. C. L.

Soprano (Edoardo). **Contributo allo Studio dell'Ulcera Fagedenica dei Paesi Caldi, o Piaga Tropicale.** [Contribution to the Study of Phagedenic Ulceration in Hot Climates or Tropical Ulcer.]—*Giorn. d. Med. Militare.* 1914. June 30. Vol. 62. No. 6. pp. 508–516.

A very good description of the condition is given. It is pointed out that the infection often takes place through some small excoriation or scratch on the skin. Some people are more liable to acquire the malady than others ; specially those debilitated by alcohol, chronic dysentery and syphilis. The cause of the condition, as has now been so often pointed out, is a bacterial spirochaete association (Vincent's bacillus). The lesion once started quickly progresses, and necrosis of the tissues takes place, leading to deep ulceration and sloughing. Complications such as diffuse gangrene, tetanus, erysipelas, slight cachexia, diarrhoea and profuse haemorrhage are mentioned by the author. The diagnosis in general is easy, but has to be made from oriental sore, yaws, and various syphilitic ulcerative conditions. The disease is prevented by careful attention to all wounds, and co-existing maladies, such as malaria and syphilis, should be suitably treated.

As regards treatment the thermocautery, scraping, and various caustics are recommended. Later, to stimulate granulations, tincture of iodine, airol, vioform and iodoform are all recommended.

[The importance of early diagnosis and treatment is apparent in dealing with large bodies of troops.]

G. C. L.

Jouveau-Dubreuil (H.). **Ulcère phagédénique à Tchentou (Setchouen, Chine).**—*Bull. Soc. Path. Exot.* 1914. June. Vol. 7. No. 6. pp. 469–472.

Phagedenic ulceration was first described at Setchouen in 1909 by Assmy, who observed it in patients in the German hospital of Tchongking. In the pus of these ulcers he encountered (1) a fusiform bacillus, (2) a short curved bacillus, (3) spirochaetes, and (4) other organisms. Jefferys and Maxwell report this description of Assmy's as the first made of that affection in the whole of China.

In the space of some months the author encountered five cases at Tchentou, which corresponded with the well known descriptions of the disease. The symptoms he describes are characteristic, and fusiform bacilli and spirochaetes were found in the ulcers.

G. C. L.

BARLOW (Nathan). **Ulcus Interdigitalis Foetidum.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1914. June. Vol. 1. No. 12. pp. 868–869.

Three cases of a form of interdigital ulcer causing prolonged debility are described. One of the cases was a secondary infection to hookworm disease, the second to a slight wound, while the third originated independently. The author believes the condition to be a specific infection due to a special organism.

The patient first notices pain in an already existing fissure, this gradually enlarging to an irregular ulcer with a tendency to invasion of the other interdigital clefts of the same foot. The floor of the ulcer is bright red in colour, the surrounding skin being white and sodden in appearance. Serum oozes out but no blood. Pain is marked. The affected foot and ankle and, after walking, even the calf become swollen.

For treatment, 5 per cent. cocaine is useful if the pain is severe. Pledgets of cotton saturated with 3 per cent. salicylic acid in alcohol are then applied for five minutes, being replaced by dry cotton, which should be frequently changed, so as to keep the part absolutely dry.

This procedure is repeated twice daily until the ulcer has completely healed. The patient should be warned against walking until all pain has disappeared. This generally takes three or four days and after that limited walking may be permitted, the entire front of the shoe being cut away to prevent pressure on the part.

G. C. L.

DOLLEY (Gilman C.). **The "Blue Button," an Undescribed Type of Tropical Ulcer of the West Indies, with Notes upon a Diplococcus Specific to the Disease.**—*Military Surgeon.* 1914. Sept. Vol. 35. No. 3. pp. 246–250. With 1 text fig.

During practice in the Dominican Republic the author had exceptional opportunities of studying large numbers of ulcers, which came to a dispensary under his care. The greater part proved to be specific in origin, but in eighteen cases the ulcers were of a distinctly different type. From these the author succeeded in growing a large uncapsulated diplococcus, fully twice the size of the diplococcus of NEISSER. In one instance pus from a newly opened blue button was applied to the scarified skin of a white volunteer and within several days a typical button developed at the point of inoculation. When this was incised it yielded a practically pure culture of the same diplococcus. After infection has taken place a tumour develops in exactly the same manner as a moderately large furuncle. There is pain, redness, heat and swelling and in from five to seven days the maximum is reached, the full size being not quite as large as a pigeon's egg. The colour is dusky bluish red on the top, fading to an inflammatory red at the periphery. Fluctuation then appears and rupture, unless the part is opened surgically. After this a more or less circular floored ulcer remains, discharging a thin sanguineous pus. If this is untreated, an increase in size takes place and there is little tendency towards spontaneous healing. The best treatment, the author found, was to curette and to trim the walls and floors of the ulcer with scissors, after removal of the cores, the interior being painted

with tincture of iodine at moderately frequent intervals, The healed sore leaves a thin, slightly puckered scar in the skin, not adherent to the subcutaneous tissues. The author's conclusions are as follows :—

"That 'The Blue Button' is a not unusual disease in the West India Islands and Antilles.

"That this disease is caused by a specific diplococcus, having peculiar morphological and cultural characteristics.

"That the disease is infectious but not contagious.

"That it is a local infection involving only the tissues of the skin.

"That as it occurs usually on covered parts of the body it is not borne by an insect such as a biting fly."

G. C. L.

Willcocks (F. C.). **The Predaceous Mite *Pediculoides ventricosus*, Newport. A Parasite of the Pink Cotton Boll Worm, and an Account of its Relation to the Outbreak of a Supposed Skin Disease amongst Labourers engaged in Handling Cargoes of Egyptian Cotton Seed at the London Docks and at a Colchester Oil Mill.** — *Agricult. Jl. of Egypt.* 1914. June. Vol. 4. No. 1. pp. 31–52. With 1 plate.

In January, 1914, a number of dock labourers engaged in discharging certain cargoes of Egyptian cotton seed in the London Docks complained that the handling of this material produced a rash on the skin, accompanied by severe irritation and discomfort.

The cause of this has now been determined to be a mite (*Pediculoides ventricosus*), present in the seed as a natural parasite on the pink boll worm, one of its many hosts. This mite, according to the author, has long been known to cause occasional outbreaks of skin trouble amongst human beings handling or otherwise coming into contact with grain or straw infested with some insect on which it (the mite) is feeding as a parasite. A similar condition has been described in America, Webster amongst others having given a good description of it. The rash appears to develop some twelve to sixteen hours after the patient has been exposed to the bites of the mite. Itching is very pronounced and is worst at night. The lesion produced is described by Webster as a vesicular urticaria and is generally seen on the back, sides and abdomen and less frequently on the arms and legs. The neck is seldom involved and the face, hands and feet generally escape. In severe infections the complaint has been mistaken for smallpox. [The subsequent course of the disease and treatment is not mentioned.] As regards future trouble in handling these cargoes the author believes that this will not long persist, at least in an acute form, as a campaign for the destruction of the pink boll worm, the mites' host, is now being carried on in Egypt.

G. C. L.

Ray (Joseph Numa). "**Raw Lip**".—*Trans. Soc. Trop. Med. & Hyg.* 1914. June. Vol. 7. No. 6. pp. 219–223.

Raw lip is a chronic affection of the lower lip met with as a rule only amongst the negro labouring classes and especially in those persons who work out of doors. The lip becomes very red and swollen, this vary-

ing in degree from a slight thickening to a marked hypertrophy, or even in some cases to a pendulous condition.

The redness appears to be due to superficial ulceration and is accompanied, in many cases, by an outgrowth of granulation tissue. The ulcerated surface, approximately a quarter of an inch wide, does not usually extend to the angles of the mouth.

The upper lip is never affected. The youngest patient noticed by the author was sixteen, the oldest seventy. The affection once begun continues for the rest of life; amelioration, however, and even temporary cures are sometimes seen.

There are no constitutional symptoms and the condition is not associated with any known diseases. Different treatments have been employed. Glycerine of resorcin has given the best results, but protargol has also proved useful. In one case the author removed the whole of the affected part with the knife under a general anaesthetic and the affection did not appear again for three years.

A series of cases is given.

G. C. L.

GESSNER (H. B.). **Case of Bilateral Ainhum.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1914. Sept. Vol. 2. No. 3. p. 206. With 1 plate.

An interesting case of bilateral ainhum is described. Spontaneous amputation of both little toes at the same time took place in 1907. The patient, a negro plantation labourer, was working in river sand at the time building a house. According to his account the process took one month, the condition being painless and not associated with any bad smell. He had never been out of Louisiana. A photograph is given.

G. C. L.

HARPER (F. S.). **Molluscum Fibrosum Pendulatum Atque Elephantiacum. A Short Account of a Case.**—*Jl. Trop. Med. & Hyg.* 1914. Oct. 1. Vol. 1. No. 19. p. 291. With 1 plate.

A short account of a case of molluscum fibrosum in a native woman living in the Northern Territory of the Gold Coast. The patient apparently was afflicted from an early age, and an interesting feature in her case was that her mother was similarly affected. Some very good photographs showing the distribution of the disease are given.

G. C. L.

MYIASIS.

Francaviglia (M. Condorelli). (i) **Myiasis Auricolare per** *Sarcophaga carnaria* **(L.).** [Auricular Myiasis caused by *Sarcophaga carnaria.*] —*Boll. Accad. Gioenia Scienze Naturali in Catania.* 1913. Nov. Ser. 2. No. 28. pp. 7–10.

(ii) **Ancora sulla Mjiasi Auricolare.**—*Ibid.* 1914. May. No. 31. pp. 15–23.

i. In the last few years four cases of auricular myiasis, due to *Sarcophaga carnaria*, have been published in Italy. Francaviglia now supplies a fifth. The larvae in this case were sent to him by Condorelli of Catania, who had extracted them by forceps from the external auditory canal of a young peasant. The symptoms consisted of violent lancinating pains with a sensation of something moving in the external auditory canal, headache, giddiness and a tendency to convulsions. Deafness was also present and a sero-sanguineous foul smelling discharge came from the ear. To get rid of the parasites the author suggests a five per cent. solution of carbolic acid, to be followed up with irrigations of tepid boracic acid. Instead of this an oily liquid may be introduced into the ear, this acting by asphyxiating the larvae. Vapour of chloroform is another remedy. It is advisable to act quickly as otherwise the parasite may perforate the drum of the ear. A description of the fly is given.

ii. The author here mentions other species that have been found in the human ear, namely *Sarcophaga magnifica* Schiner, *Lucilia macellaria* Fabr., *Calliphora vomitoria* (L), and *Anthomyia pluvialis*. *S. magnifica* is common in districts of Russia. When found in the ear these larvae devour the soft parts of the auditory canal and frequently perforate the tympanum. As regards Italy, Biasoli of Turin has described two cases of infection by this fly.

Lucilia macellaria (*Compsomyia macellaria*) is the well known fly which occurs in the Southern States of America, the West Indies, and the Isthmus of Panama. Cases of infection of the nose, ear and vagina by this parasite are common in those parts.

Calliphora vomitoria appears to be specially common in France.

Attacks by the *Anthomyia pluvialis*, the last of the list given above, have been recorded, but are apparently not very common.

G. C. L.

Francaviglia (M. Condorelli). **Larva di** *Oestrus ovis* **L. per la Prima Volta rinvenuta nel l'Orecchio Umano.** [Larva of *Oestrus ovis* L. recovered for the First Time from the Human Ear.]—*Boll. Accad. Gioenia Scienze Naturali in Catania.* 1914. May. Ser. 2. No. 31. pp. 23–27.

A patient presented himself to the author suffering from severe pain in the right ear, radiating to the corresponding part of the head. There had been no vomiting nor vertigo, but the pains were associated with a sensation of something moving about in the ear. On examination a turbid serous discharge was noticed. Inspection of the ear showed that there was a foreign body present, so a saturated

solution of chloroform was introduced. After a few minutes the foreign body, which proved to be a larva of a fly, was removed with fine forceps. An examination showed that it was the larva of *Oestrus ovis*. G. C. L.

COATES (George M.). **A Case of Myiasis Aurium accompanying the Radical Mastoid Operation.**—*Jl. Amer. Med. Assoc.* 1914. Aug. 8. Vol. 63. No. 6. pp. 479–480.

A boy, aged 14, an inmate in the Pennsylvania Institution for the Blind in Philadelphia, was operated upon for middle ear disease, a radical mastoid operation being performed.

The dressings and packing were removed on the third day and then it was found that the wound had become infected with maggots, 40 or 50 of these coming away with the gauze or being washed out immediately afterwards. The species of maggot was not identified and the author cannot understand how the infection took place. There had been a chronic discharge from the ear before the operation, however, and it is likely that this was the channel of infection. The ear was packed with iodoform gauze, with the result that no further maggots were discovered at subsequent dressings.

G. C. L.

ROUBAUD (E.). **Le Larbish ou Oerbiss des Ouoloffs, Pseudo-Myiase rampante sous-cutanée du Sénégal.**—*Bull. Soc. Path. Exot.* 1914. May. Vol. 7. No. 5. pp. 398–401.

BÉRANGER-FÉRAUD in his clinical treatise on eruptions in Senegal describes, under the name of *Larbish*, a curious cutaneous affection called Oerbiss by the Ouoloffs which specially occurs during the winter months. The lesion is characterised by the appearance on the limbs or on the body of a small filiform canal apparently under the epidermis but showing up under the surface of the skin and filled with a clear serous fluid. The patients complain of a burning sensation and believe that there is a worm crawling about under their skin. The affection can last many months. The treatment consists of injections of sublimate or painting the canal with iodine. The condition is fairly frequent in Senegal and is also met with in other parts of West Africa. At first sight the disease appears to be identical with that special category of Myiases, named *Myiase rampante* or *Myiase linéaire* (Hautmaulwurf, Creeping Disease of German and English authors, Volostik of the Russians).

The author after considering the subject in detail believes that, though its clinical signs are similar to the affection just mentioned, the cases seen in Senegal on the West Coast of Africa, and in Brazil, are due to some other parasite.

G. C. L.

AUERHANN (Wilhelm). **Zwei Fälle von Hyponomoderma (Creeping Disease).** [Two Cases of Creeping Disease.] –*Dermatol. Wochenschr.* 1914. June 13. Vol 58. No. 24. pp. 673-676.

The first case was in a child three and a half years of age, the second in a female peasant. The author treated the former with the usual

drugs used for scabies without effect and then by freezing with ethyl chloride. This seemed to have a good effect upon the condition. Later on the larva apparently came away, but the author did not actually see it. A short account of the literature of the subject is given, and some cases noted by other observers are mentioned.

G. C. L.

Blankmeyer (H. C.). **Intestinal Myiasis. With Report of Case.**—*Jl. Amer. Med. Assoc.* 1914. July 25. Vol. 63. No. 4. p. 321.

In 1907 the author reported a case of infection with *Anthomyia canicularis* as the eighteenth on record at that time, five having been reported in America, five in Germany, and the remainder in England, France, Sweden and the Argentine.

He now reports another case, namely that of a woman, a native of Illinois. The condition seems to have begun 14 years ago with nausea and vomiting, larvae being passed in the stools some months after the commencement.

Two years ago constipation set in, this persisting till the present time in a chronic form. Under treatment, dram doses of magnesium sulphate before breakfast and at 4 p.m. with 5 grain doses of salol four times a day, some signs of improvement have appeared, but 4 to 50 larvae per day are still being passed. The author, however, believes that the prognosis is favourable. He refers to fatal cases reported by Cachange and to an interesting one mentioned by Finlayson of Glasgow. In this after protracted constipation and chronic pain in the back and sides the patient passed large numbers of Anthomyia larvae.

In most cases, however, no grave symptoms are seen as a result of the invasion of the intestinal tract by the larvae.

[The chronicity of the case described above requires explanation. It is difficult to understand how it could have gone on as long as 14 years. Perhaps the passage of the larvae had nothing to do with the symptoms, which seem mainly to have been uterine in nature.]

G. C. L.

MacGregor (Malcolm Evan). **The Posterior Stigmata of Dipterous Larvae as a Diagnostic Character: with Especial Reference to the Larvae incriminated in Cases of Myiasis.**—*Parasitology.* 1914. June. Vol. 7. No. 2. pp. 176–188. With 3 plates and 3 text figs.

The author believes that good diagnostic characters are required, both by entomologists and physicians, for identifying the different larvae which cause myiasis. Often, as he points out, rearing the adult fly is impossible owing to the fact that the material to be examined is dead. He therefore undertook a comparative study of the morphological characters of the posterior stigmata of some of the different larvae. The technique for making the examination is given in detail. The whole of the softer tissues is removed by boiling in potash so as to leave only the chitinous structures intact. The larvae are hardened in absolute alcohol for several days and are then sectioned by hand, without imbedding, with a keen microtome knife or a carefully sharpened

Gillette razor blade. A description of the stigmata as seen in *Lucilia caesar* Linn., *Cynomyia cadaverina* Desv., *Calliphora vomitoria* Linn., *Sarcophaga sarraceniae ?* Riley, *Chrysomyia* sp. *incert.*, *Musca domestica* Linn., *Stomoxys calcitrans* Linn., *Haematobia serrata* Desv., *Gastrophilus equi* Clark, and *Oestris ovis* Linn., is given. Three plates are appended.

Those interested should consult the original paper.

G. C. L.

HELMINTHIASIS.

Filariasis.

Ringenbach (J.) & Guyomarc'h. **La Filariose dans les Régions de la Nouvelle Frontière Congo-Cameron. Observations sur la Transmission de *Microfilaria diurna* et de *Microfilaria perstans*.—*Bull. Soc. Path. Exot.* 1914. July. Vol. 7. No. 7. pp. 619–626.

Filaria bancrofti has been noted on the Congo in the region of Brazzaville, but owing to the fact that the natives objected to being disturbed at nights the authors could not determine its existence or otherwise in the regions traversed by themselves. Cases of elephantiasis were, however, seen: for example, between the sea and the Ivindo three in which the scrotum was affected and two the legs; between the Sangha and the Lobaye seventeen [variety not stated], ten in men and seven in women; and between the Lobaye and the Ouham four.

Filaria loa, as already noted by Brumpt and Ouzilleau, occurs in parts of the Congo. During the work of the Boundary Commission five examples of an adult *F. loa* in the eye were seen, three in natives of the same region (Pahouins), the fourth in a Loango porter, the fifth in a European, while in the South and East Kamerun sections five other Europeans showed Calabar swellings and erythema.

Filaria perstans was very common and was often associated with other filariae in the blood, the authors quoting Ouzilleau as saying 30 times out of 100 in M'Bomou, and Brumpt, 10 times out of 100 in Ouellé.

Onchocerca volvulus is also common.

As regards intermediate hosts the authors state that on the Gaboon and middle Congo a biting fly, designated by the Pahouins *Oseun*, is very common in the wet season. This is a Chrysops, *C. centurionis* Austen. In the blood in the stomach of such flies after sucking infected persons *Filaria loa* and *F. perstans* embryos were often found, but opportunities were wanting to carry out further researches to determine the evolution. Leiper's observations in Southern Nigeria are referred to, the statement being made that *C. dimidiata* and *C. longicornis* are the only known species of Chrysops in those parts.

[Leiper worked with *C. dimidiata* and *C. silacea* and found that a rapid development of *F. loa* embryos took place in their salivary glands (see this *Bulletin*, Vol. 2, p. 196). He mentions *C. longicornis* as occurring there also, but could not get sufficient of these flies to work with. On epidemiological grounds the authors' *C. centurionis* must also now come under suspicion for *F. loa*, but there is no evidence that it, or any Chrysops, acts as a host for *F. perstans*.]

The endemic index for filariasis in the regions traversed is summarised in the following table :—

ENDEMIC INDEX OF FILARIASIS.

I. North of the Gaboon (from the sea to the Ivindo).

	Number of natives examined.	*F. perstans.*	*F. loa.*	*F. perstans* + *F. loa.*	Total of natives filariated.	Percentage filariated.	Percentage of *F. perstans.*	Percentage of *F. loa.*	Percentage of *F. perstans* + *F. loa.*
Men	445	225	41	63	329	73·9	50·1	9·2	14·1
Women ..	294	163	21	48	232	78·9	55.4	7·1	10·7
Children ..	210	56	5	8	69	32·8	26·6	2·38	3·8
Total ..	949	444	67	119	630	—	—	—	—

II. From the Sangha to the Lobaye :

Natives examined,	Natives filariated,	per cent.
2,252	1,284	57·01

III. From the Lobaye to the Ouham :

Natives examined,	Natives filariated,	per cent.
376	165	43·88

[An analysis of these figures shows the great frequency of *F. perstans*. It is unfortunate that night blood could not be obtained as, with *F. bancrofti* included, the comparison would have gained greatly in value.]

G. C. L.

LEBER (A.). **Beiträge zur Klinik und Therapie der Filarienkrankheit in der Südsee.** [The Symptomatology and Treatment of Filariasis in the South Sea.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. July. Vol. 18. No. 13. pp. 454–463.

Sixty per cent. of the grown-up Samoan natives are affected with elephantoid swellings or are the subjects of filarial inflammations. The first manifestations of the disease very often show themselves about the time of puberty and the author quotes an example of "Mu-Mu" fever in a boy of twelve.

The local appearances of the attacks are as follows :—

(1) Lymphatic swellings : cubital, inguinal, axillary, cervical.

(2) Peripheral lymphangitis from the inflamed glands.

(3) Inflammatory oedema of the extremities with secondary gland swelling.

Haematochyluria was only seen once and orchitis is also uncommon amongst the natives, but it is seen more frequently in Chinese immigrants, in whom it may be the only symptom present. In the later stages of the disease abscesses, either superficial or deep in the

muscles, are frequent. Associated with these, fibrous thickening of the surrounding tissue is common.

As regards treatment, in Mu-Mu fever antipyretics such as quinine, antifebrin and antipyrin are employed. For general treatment of the disease phenocoll was tried and a series of cases treated by the remedy is described.

In old cases with much fibrous thickening injections of fibrolysin into the diseased tissues were found to be of use.

G. C. L.

YOUNG (W. J.). **A Study of the Nitrogenous Metabolism in Chyluria.** —*Jl. Trop. Med. & Hyg.* 1914. Aug. 15. Vol. 17. No. 16. pp. 241–244.

The author, who writes from the Australian Institute of Tropical Medicine, Townsville, opens his paper with the statement that the condition of the urine in chyluria has hitherto been studied from the point of view of the fatty material which it contains, but that very little work has been done on the albuminous matter and other nitrogenous constituents. In 1913–14 two cases of chyluria were admitted to the tropical ward of the Townsville General Hospital and the opportunity was taken to examine the urines with regard to the distribution of nitrogen in them A history of the two cases is given. Both were cases of true chyluria, the urines always containing fat which could be extracted with ether, though the milky appearance could not be entirely removed in this way. An estimation of the quantity of fat in the urine was only made on one 24-hour sample in each case. The method employed was a modification of that devised by MEIG. The result of this analysis showed that the 24-hour sample of case 1 contained 1·8 per cent. of fat, while that of case 2 gave 2·6 per cent.

"The protein nitrogen was determined by adding 20 cc. of a saturated solution of sodium chloride to 100 cc. of the urine contained in a 200 cc. measuring flask, making faintly acid with acetic acid and, coagulating the protein by immersing the flask in a bath of boiling water for 30 minutes.

"The mixture was then cooled, made up to the mark with distilled water, filtered, and the unprecipitated nitrogen determined in an aliquot part of the clear filtrate by Kjeldahl. The difference between this non-protein nitrogen, calculated up to the original volume of the twenty-four hour urine, and the total nitrogen of the urine determined by Kjeldahl, corresponded to the nitrogen present as protein."

The other nitrogenous constituents were determined in the urine after removal of the protein, the urea by Folin's potassium acetate method, ammonia (Folin), uric acid (Folin-Schäfer), creatinine and creatine (Folin).

A series of tables shows the results of the various analyses. Filaria larvae could not be found in the peripheral blood, either during the day or during the night, but the author is of the opinion that the cases were filarial in origin.

The general protein metabolism was not apparently affected by the continued loss of lymph. In the first case the level of protein catabolized was very low, but the relative quantities of ammonia, uric acid and creatinine were in the same order as those in normal urines with similar protein levels of metabolism.

In the second case, when the diet was constant in amount and of normal protein content, the nitrogenous equilibrium was more than maintained

The quantity of chyle in the urine, as measured by the proteins excreted, was on the average the same whether the diet was free from fat or rich in fat. The quantity of proteins present in the urine, according to the author, is the best guide to the condition of the patient in chyluria, since these are the substances which clot to jelly-like masses and cause the difficulty of passing the urine which is so often complained of in those cases.

G. C. L.

Dracontiasis.

Liston (W. Glen) & Turkhud (D. A.). **Guinea-Worm Disease in an Indian Village.**—*Proc. Third All-India Sanitary Conference held at Lucknow Jan. 19–27*, 1914. Vol. 4. Papers. Suppl. to *Indian Jl. Med. Research.* pp. 120-123.

In one of the two wells of a village [unnamed] reported by the Civil Surgeon of Thana the authors found that 44 out of 114 cyclops contained young guinea-worms (*i.e.*, 38·6 per cent.) in the month of March 1913. There were sixty-two inhabited houses in the village with a population of 269 souls, 150 males and 119 females. During an epidemic of dracontiasis in the current year [1913] cases occurred in 20 houses amongst 29 persons, *i.e.*, 10.78 per cent. of the villagers. So far as could be gathered 98 persons out of the 269 inhabitants (*i.e.*, 38·68 per cent.) had been afflicted by the disease in past years; of these 43 per cent. were males, 26 per cent. females. Although the water is so scarce that the supply of each house is strictly limited during two or three months of the dry season, it is so little prized and protected that the men and boys have a common practice of swimming and bathing in the wells.

R. T. Leiper.

Turkhud (D. A.). **The Distribution of Guinea-worm in India.**—*Proc. Third-India Sanitary Conference held at Lucknow, Jan. 19–27*, 1914. Vol. 4. Papers. Suppl. to *Indian Jl. Med. Research.* 1914. pp. 124–129. With a map.

Although dracontiasis is generally admitted to be widely distributed over the Indian Peninsula no reliable data are available to determine with any degree of accuracy the extent to which it is present in the different parts of the country. The only official figures are those recorded in the Annual Report of the Sanitary Commissioner in connection with the statistics pertaining to the Native Troops and Prisoners, and even here the figures for the troops are discontinued in 1908.

The whole of India has been divided, as shown in the map reproduced, into eleven geographical groups representing areas which are fairly

H.S
0
B
4·33
VII
VI
A
10·11
C
0·78
H.S
0
B
2·79
A
10·66
VIII
B
28·10
10·53
A
39·6
XI
H.S
0

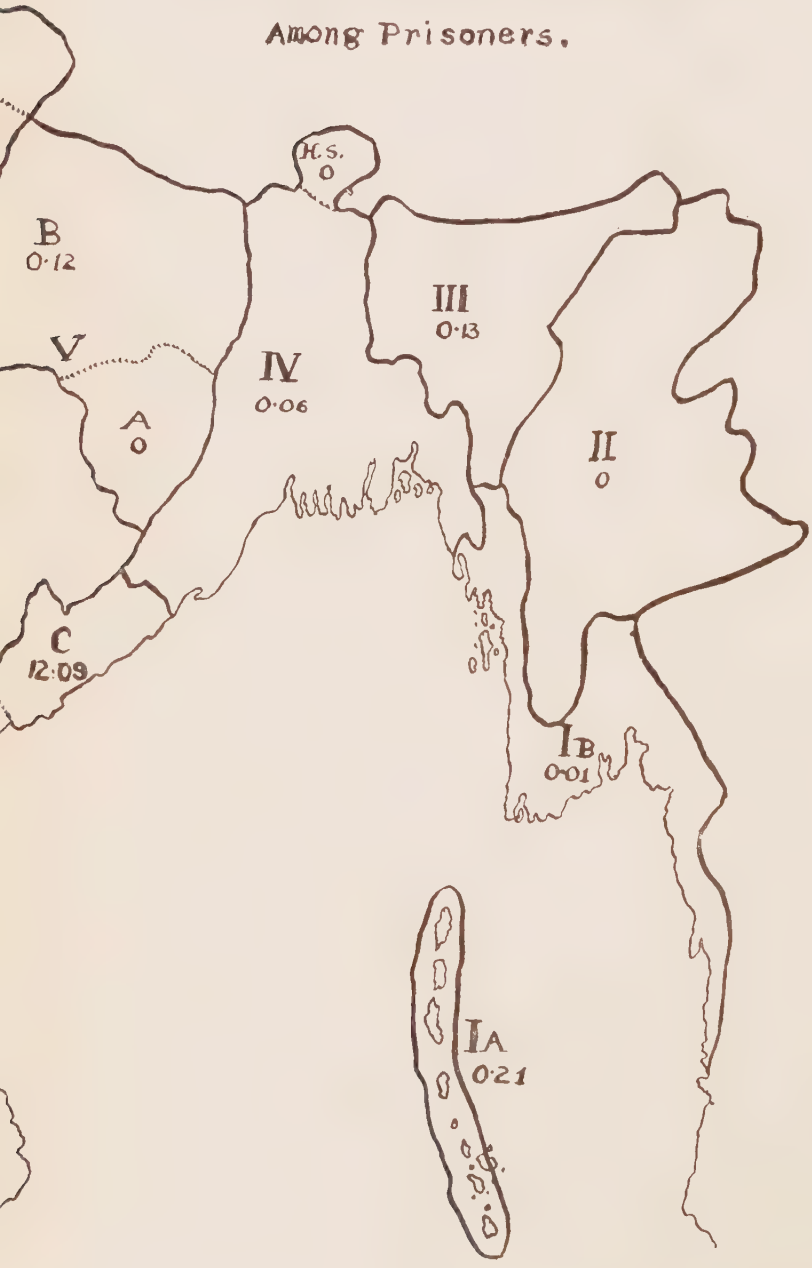
MAP OF

INDIA

Showing the Distribution
of

DRACONTIASIS

Among Prisoners.



homogeneous so far as the chief prevailing diseases and climatic conditions are concerned, viz. :—

I. Burma Coast & Bay Islands.
II. Burma Inland.
III. Assam.
IV. Bengal & Orissa.
V. Gangetic Plain & Chutia-Nagpur.
VI. Upper Sub-Himalaya.
VII. North-West Frontier, Indus Valley & N.W. Rajputana.
VIII. S.E. Rajputana, Central India & Gujarat.
IX. Deccan.
X. Western Coast.
XI. Southern India.

These groups are divided into smaller sub-divisions, *e.g.*, A, B, C. H.S. indicates Hill Stations. The figures on the map give the mean ratio per annum per thousand prisoners. The reader will gather from the text of the paper how exceedingly misleading these statistics may be.

R. T. L.

PLAGUE.

van Loghem (J. J.) & Swellengrebel (N. H.). **Kontinuierliche und metastatische Pestverbreitung.** [The Spread of Plague Continuous and Metastatic].—*Zeitschr. f. Hyg. -u. Infectionskr.* 1914. Vol. 77. May 27. No. 3. pp. 460–481. With 4 figures and 2 plates.

As far as Java is concerned only two kinds of rats need be considered in connection with the spread of plague—the house rat (*Mus griseiventer* Bonhote) and the small house rat (*Mus concolor* Blyth). These are both regarded as varieties of *Mus rattus*, and are described together as "house rats." They are distinguished from the field rat (*Mus diardii* Jentink) by the fact that with both varieties the tail is longer than the body, while the tail of the field rat is, like that of *Mus norvegicus*, shorter than the body. The field rat has never been known to carry plague infection in Java, and *Mus norvegicus*, which is found in isolated colonies near the coast and large rivers, is only infected with one-third the frequency of the house rat. The extreme mobility of the house rat, its predilection for human habitations, its large flea-count and high "blood-contact" all indicate its importance in the spread of plague. (The "blood-contact" is measured by the number of young rats found infected with *Trypanosoma lewisii*. It is taken as an index of the possibility of plague infection if introduced, spreading among the species. The percentage of trypanosome-infected house rats throughout the year was found to average about 30 per cent., while the percentage among field rats, during the same period, only averaged about 5 per cent.)

There are two separate and distinct methods of plague epizootic extension met with in Java. In the first (continuous method of spread) the progress of the disease is gradual but persistent, spreading slowly from house to house and from village to village. It is suggested that when the rat population of an infected house is decimated by plague, the area is then invaded by the rats belonging to a neighbouring community, which carry away with them plague infected fleas, and thus spread infection. It is difficult to demonstrate the spread of rat plague from village to village, but the authors have found plague-infected *Xenopsylla cheopis* on rats in villages where no case of human plague has occurred, clearly showing that the house rat carries plague from infected to non-infected districts.

The second method of plague dissemination is described as the metastatic or discontinuous method of spread. The epizootic suddenly appears simultaneously in several different centres, from which it spreads slowly. Observations in Java do not support the hypothesis advanced by the Indian Plague Commission that the infection is transmitted by human agency—infected fleas being carried in clothing or personal luggage, but rather all the facts point to the conclusion that the house rat is the almost invariable vector of the disease. This rat is a great traveller and is often found in vehicles used for the transport of food-stuffs (rice especially). At the commencement of the plague epizootic in Java, large numbers of dead house rats were found in the railway goods-waggons, and plague has been observed to spread along the lines of commercial, and not necessarily of human, intercourse.

An examination of the ecto-parasites found on the fumigated clothing and luggage of 56,790 natives on the borders of the infected Melang Department of Java revealed the presence of only three rat fleas. The investigation was conducted from 14th February to 15th May: the actual figures are very interesting and are here appended:—

2 *Xenopsylla cheopis,*	1916 *Pediculus hominis,*
207 *Pulex irritans,*	707 *Cimex rotundatus,*
1 *Pigiopsylla ahalae,*	6 Acarines,
9 *Ctenocephalus canis.*	1 Reduviid.

The conclusion arrived at is, in contradistinction to Indian experience, that human beings cannot be seriously considered as important factors in the spread of plague epizootics. This may be accounted for by the relatively lesser severity of the disease in Java, both among man and rats, and also by the much smaller flea counts on rats as compared with India.

R. St. John Brooks.

van Loghem (J. J.) & Swellengrebel (N. H.) **Zur Frage der Periodizität der Pest auf Java.** [The Periodicity of Plague in Java.]—*Zeitschr. f. Hyg. -u. Infectionskr.* 1914. June 24. Vol. 78. No. 1. pp. 131–150. With 7 figures.

In this paper, matters of considerable interest are discussed with reference to the irregularity of plague epidemics in Java and to the question of "regional immunity."

Plague made its appearance in Java in the Melang Department (1911) and almost at the same time the disease manifested itself in Surabaya, Kediri and Madiun. Surabaya was the probable point of entry, the disease being spread thence by the railway. From the examination of subsequent statistics it appears that the times of the year in which the epidemics commence and reach their height respectively, show great variations. The commencement of the various epidemics has taken place in April, May, June, September, October and December. The height of the epidemic (in Melang) has been reached in February, April, May, June, August and December. Indian experience has been very different, and a marked periodicity, indirectly dependent on climatological factors, has constantly been observed, the epidemic reaching its maximum in the cool and moist part of the year and dying away in the hot and dry season.

In Java, which possesses an equatorial climate, the dry season (east monsoon) lasts from May to September, while the rainy season (west monsoon) sets in in November and terminates in March. The temperature is fairly constant throughout the year, and even in the dry season the relative humidity is high (60 to 70 per cent.). The mean monthly temperature varies some two or three degrees but the fluctuations in the relative humidity are somewhat greater (17 per cent.). This fluctuation is, however, very slight in comparison with variations observed in British India (Poona 46 per cent.), and it is concluded that climatic influences can only play a very subsidiary role, if regarded as a factor in the intensity of plague epidemics in Java. Indeed in Melang, in the wettest months of the year 1912, very few cases of plague occurred, while the epidemic was very severe in the dryest period of the same year.

Investigations regarding the flea infestation of the rodent population were made in the usual way, and the number of fleas per rat was found to increase in the plague infected districts during epidemics, the fleas becoming more and more concentrated on the decreasing rat population. ("Secondary concentration.") This phenomenon was found to be quite independent of climatic conditions. In districts that remained practically free from plague (e.g. Ngantang) the number of fleas collected was very small (average 0·6). The fluctuations in the flea counts were found to be correlated with variations in the relative humidity, but were considered to be too small to have any significance in connection with the rise and fall of the epidemics.

Similarly, an investigation with regard to the numbers of pregnant female rats, made for the purpose of determining the increase and diminution in the number of young rats at different times of the year, revealed the fact that the fluctuations were very irregular and bore no relation to the variations in intensity of plague.

No satisfactory explanation can be given as to the regional immunity of Surabaya. The question is discussed from all the above points of view, but with the exception of the fact that *Mus norvegicus* is frequently found in Surabaya and is practically absent from the other points of observation, there are no noteworthy differences in conditions in Surabaya and elsewhere. The suggestion is thrown out that the relative immunity of this town may be due, possibly, to chance circumstances.

R. St. J. B.

Heiser (Victor G.). **Reappearance of Plague in the Philippines after an Absence of Six Years. Brief Description of the Outbreak, the Methods used to combat it, and the Probable Factors in its Introduction.**—*Philippine Jl. of Science.* Sect. B. Trop. Med. 1914. Feb. Vol. 9. No. 1. pp. 5–37. With 1 map.

With regard to this epidemic, the first case of human plague was reported on the 17th June 1912, and up to October 1913, 68 cases with 58 deaths had occurred in Manila, and 9 cases with 9 deaths in Iloilo. The disease was probably introduced by plague rats or infected fleas present in cargo from infected ports, which cargoes were not unpacked until distribution in the city. The plague infection among the rats was very low, being less than 0·002 per cent., and of the 48 infected rats that were trapped only one was at all sick, and only one was found to be dead of plague. The first case of human plague preceded the first recognised case of rat plague by more than two months Among the human cases one appears to have been of peculiar interest. After the death of the editor of the "Manila Daily Bulletin" from plague, a mummified plague rat was found in one of the drawers of his office desk, along with a number of plague-infected *Xenopsylla cheopis*. The rat had been dead for fully two weeks, and the assumption is that the fleas retained their powers of infection for at least that period.

In the course of their investigations, the sanitary authorities were able to confirm the statements made by workers in Java with regard to the nesting of rats in the hollow bamboos used in the erection of dwelling-houses. The sanitary methods used to eradicate the disease

appear to have been very thorough, and new regulations have been formulated, including those providing for the proper rat proofing of new buildings.

With regard to the trapping of rats, the spring or snap trap was found to be ten times as effective as the wire cage trap, which latter was, however, more effective than poisoned bait.

R. St. J. B.

Kunhardt (J. C. G.). **Further Investigations into the Persistence of Plague Infection in the Villages of Poona District during the Off-Season.**—*Proc. Third All-India Sanitary Conference held in Lucknow, January* 17-27, 1914. Vol. 5. Papers Suppl. to *Indian Jl. Med. Research.* pp. 116–125. With 4 charts.

In his previous paper on this subject [this *Bulletin*, Vol. 4, p. 15], Kunhardt assumed tentatively that a list comprising all the villages in the Poona district which returned plague cases during the first three months of the plague season (July, August and September), as well as any of the six months which precede that period, would include most of them that carried plague over the off-season. In order to complete this investigation, the records of the plague Progress Reports of the Government of Bombay were investigated and the subsequent history of all villages infected during any two years was examined. Only villages with a population of over 300 were considered.

As the result of these investigations it is concluded :—Epidemics of village plague are almost all limited to one plague season. Rare instances of overlapping occur in villages infected late in the plague season, but if plague terminates by December, the disease does not carry over into the next season. (Poona is a notable exception to this rule A large town like Poona resembles in its behaviour a group of villages and various portions become infected in turn, and thus there is but little dfficulty in the disease surviving the off-season.) No case of plague that cannot be explained on the grounds of re-importation occurs during the second plague season after the month of September. " All places which show plague cases in the first three months of the plague season, as well as in any of the previous six months, would, under normal conditions, include most of those that carry plague infection over the intervening off-season ; the few exceptions being those places which, infected either immediately previous to or during the off-season, do not for various reasons, return human cases or deaths till the following plague season has commenced."

R. St. J. B.

East Africa Protectorate. **Annual Report for the Year ending 31st December 1913.** (1914.) pp. 68-90. **Report on the Outbreak of Plague in Mombasa, for the Year September 1912-1913.**

During the period under consideration 203 cases of plague, with 177 deaths, occurred in Mombasa. Of these, 33 cases were pneumonic in origin. The report gives full details of the course of the epidemic and of the sanitary and preventive measures taken by the Medical Staff to get the disease under control. Rat collection and examination was only undertaken with great difficulty, on account of passive and active opposition from the inhabitants, and only a very small percentage

of the rats collected were found to be infected. The employment of Clayton gas in the disinfection of houses was very successful. The bulk of the population of the town was inoculated with Haffkine's prophylactic; out of a consecutive series of 224, plague occurred in 20 persons or in 8·9 per cent. of the total. During the whole period the case mortality among the inoculated was 80 per cent.; among the uninoculated 87 per cent.

R. St. J. B.

Francisco Tello (J.) & Ruiz Falcó (Antonio). **La Peste Bubónica en la Zona de Influencia Española en Marruecos.** [Bubonic Plague in the Zone of Spanish Influence in Morocco.]—*Bol. Inst. Nac. de Alfonso XIII.* 1914. June. Vol. 10. No. 38. pp. 97-143. With 2 plates, 3 plans and 1 curve.

The authors deal in this communication with two small outbreaks of plague which occurred in the zone of Spanish influence in Morocco, at the military camps situated at Alcazar and Larache respectively.

The epidemic started at Alcazar on September 13th, 1913, and in all 76 cases of plague occurred, with the low mortality of 26 per cent.: 53 of these cases were clinically examined and were found to be of the bubonic type, with the exception of one septicaemic case.

In Larache 22 cases were reported; 12 of the 14 observed cases being bubonic. 13 cases occurred among Spaniards with a 15 per cent. mortality and 9 among Moors with an 89 per cent. mortality. This striking difference in the death rate is not attributed to any immunity on the part of the Spanish population but rather to the conditions of life under which the Moors exist and to the lack of proper medical assistance in their communities.

The sanitary and other measures taken by the Spanish civil and military authorities to limit and finally to stamp out the epidemics are given in considerable detail, and a comparison between the French and Spanish sanitary administrations in Morocco is made, greatly to the detriment of the latter.

R. St. J. B.

Agramonte (Aristides). **The Late Outbreak of Plague in Havana.**—*Amer. Jl. of Trop. Dis. & Prevent. Med.* 1914. July. Vol. 2. No. 1. pp. 13–27. With 1 plate.

Nineteen cases of bubonic plague, with three deaths, have occurred in Cuba since the 24th February 1914. With one exception these cases were reported from the City of Havana. It is of interest to observe that the disease was confined to the male population and that the great majority of the patients (13) were Spaniards, and not native Cubans.

In the routine sanitary measures adopted to stamp out the epidemic, sulphur fumigation was employed (4 to 5 pounds of sulphur per 1,000 cubic feet), but it was soon found by means of test guinea-pigs that this method of fumigation was not satisfactory, as rats harbouring infected fleas could, by retreating into the depths of their burrows, escape from the lethal influence of the gas, and thus remain as a source of danger to the inhabitants. Subsequently hydrocyanic acid gas (obtained by the action of dilute sulphuric acid on 10 to 15 grains of

cyanide of potash for every 10 cubic metres space) was used with satisfactory results. Agramonte does not consider the use of this gas to be very dangerous provided proper precautions are employed but, on account of its rapid powers of diffusion, careful preparation of the buildings intended for fumigation is necessary.

R. St. J. B.

Wade (H. Windsor) & Starling (Houston L.). **A Study of the Early Cases of Bubonic Plague in New Orleans,**—*New Orleans Med. & Surg. Jl.* 1914. Aug. Vol. 67. No. 2. pp. 95–105.

Although rat plague occurred in New Orleans in 1912, bubonic plague infection of man did not make its appearance until the month of June, 1914. It is possible that the infection had remained latent in the rodent population for a period of two years.

This paper gives a detailed description of the clinical history of some of the earlier cases observed.

R. St. J. B.

Strickland (C.). **The Incidence of Plague in Europe, with Special Reference to the Rôle played by the Rat.**—*Lancet.* 1914. Nov. 14. pp. 1141–1143. With a diagram.

The opinion is here expressed that the comparative disappearance of plague from England is associated with charges in the rat fauna of the country ; the domesticated black rat (*Mus rattus*) being replaced by a wilder and more scattered species (*Mus decumanus*). It is pointed out that, while an 8 per cent. epizootic of plague in India may lead to a devastating epidemic, an 11 per cent. epizootic in East Anglia did not affect the human population.

In considering plague epizootics in England, the author does not think that the flea-rate bears any relation to the intensity of the epizootic, and points out that in East Anglia, while a flea-rate of 1 was associated with a plague epizootic of 11 per cent. in the winter of 1910, in the summer-autumn of 1911, when the flea-rate was 4·5, the infection rate among rats was only 0·2 per cent. In consequence, the rise and fall of the epizootic must be attributed to other factors, such as lessened density of the rat population during the summer months.

[No account is, however, taken of the very different circumstances in which the two investigations were conducted. In the former investigation the percentage figure was obtained from the examination of 123 rats which came to hand in specially selected areas in which epizootic plague was either suspected or known to exist, while in the latter investigation some 15,000 rats from over 200 parishes were examined and in only 19 cases were such parishes found to be infected. As soon as plague was diagnosed, the supplies of rats from the parish in question were immediately stopped and thus the figure 0·2 per cent. does not give any index of the percentage of infection in the infected areas.]

R. St. J. B.

Swellengrebel (N. H.) & Otten (L.). **Experimentelle Beiträge zur Kenntnis der Uebertragung der Pest durch Flöhe und Läuse.** [Experimental Contributions to the Knowledge of Plague Transmission by Fleas and Lice.]—*Centralbl. f. Bakt.* 1. Abt. Orig. 1914. July 25. Vol. 74. No. 7 pp. 592–603. With 1 text fig.

The results of these experiments agree in many particulars with the conclusions of the Indian Plague Commission regarding the carrying over of plague infection by fleas. The authors have found that infected fleas (*Xenopsylla cheopis*), after so long a period as 33 days, are still capable of transmitting infection to rats and guinea-pigs. As far as Java is concerned, however, climatological circumstances (temperature, humidity, &c.) influence the capacity of the flea to transmit infection only to a very slight degree.

Fleas infested with mites (*? Anoetus*) do not readily transmit infection. An explanation of this curious phenomenon may be gathered from the fact that the mites are often present on the pricker of the flea, and so interfere with the mechanism of blood sucking and hence with plague transmission.

The authors are of opinion that the infection is not transmitted by means of the faeces of the flea being inoculated into the bites, by scratching or otherwise, as they took scrupulous care in their experiments to avoid faecal contamination of the bites. [See in this connection the paper by Bacot and Martin on the Transmission of Plague by Fleas, reviewed in this *Bulletin*, Vol. 3. p 201].

Experiments conducted with *Pygiopsylla ahalae* were also positive; fleas being observed to be infected up to the 18th day. Successful carrying over experiments were also conducted with lice ("*Pediculus hominis*") segregated from the clothing of plague-infected persons, thus showing that these insects may also be regarded as porters of plague infection. A few transmission experiments were conducted with bugs (*Cimex rotundatus*), but the results obtained were in every case negative.

R. St. J. B.

Missiroli (Alberto). **La Reazione della Termoprecipitina nella Diagnosi della Peste.** [The Thermoprecipitin Reaction in the Diagnosis of Plague.]—*Pathologica.* 1914. July 1. Vol. 6. No. 136. pp. 331–332.

The author has found the thermoprecipitin reaction described by Ascoli in his book ("La Termoprecipitine", 1914) very useful as an auxiliary means of diagnosis in plague.

The dried serum employed for the test was obtained from the Pasteur Institute in Paris, the horses having been immunized first with dead and then with living plague bacilli. A gramme of the dried serum was dissolved in 10 cc. of physiological salt solution, and the solution was then filtered through asbestos wool under pressure until it was perfectly clear. The precipitinogen was obtained from the enlarged axillary or inguinal glands of five patients who died in an outbreak of plague in Tripoli, and also from the spleen of a child who died suddenly in the same isolation camp without presenting buboes. Numerous plague bacilli were detected microscopically in smears from the glands, and were recovered culturally from the spleen. The material was allowed to putrefy for from 30 to 40 days, until reduced

to a state of pulp, and was then extracted with ten times its weight of salt solution, the filtrate being then maintained at boiling point for from 5 to 15 minutes, and afterwards filtered until clear through asbestos wool under pressure. One cc. of this solution was then floated on the top of an equal quantity of the serum solution in a test tube by means of a pipette, the result showing itself in a uniform turbidity, or a ring formed at the junction of the two solutions, according to the amount of active substance present. The usual controls were made with normal horse serum and normal glands. The experiment was afterwards repeated with the spleens of rats experimentally infected with plague, with equal success.

In outbreaks of plague of a doubtful nature, the author thinks that this method is a useful auxiliary to diagnosis. [Though the author does not distinctly say so, it may be presumed that in such a case the tedious process of putrefaction is to be omitted.]

J. B. Nias.

Warner (Charlotte E.). **The Thermoprecipitin Method in the Diagnosis of Bubonic Plague in Cadavers.**—*Jl. of Hygiene.* 1914. Nov-Vol. 14. No. 3. pp 360–370.

The "Thermoprecipitin Method," devised by Ascoli for the diagnosis of anthrax in cattle, can be applied with certain limitations to the diagnosis of plague in rat cadavers. The method is said to be of peculiar advantage in dealing with decomposed carcases in which the ordinary methods of diagnosis are difficult to apply, and where a prompt diagnosis is required. The intensity of the reaction depends on the number of bacteria present in the tissues used in the preparation of the tissue extract, and a positive reaction accompanied by satisfactory controls is regarded as absolute proof of plague infection. A negative reaction, on the other hand, is of no value, as the tissues, though from a plague cadaver, may have contained too few bacilli to induce a definite reaction. Because of this last fact, the precipitation test can never replace the usual bacteriological methods.

R. St. J. B.

Denman (Robert). **Electrargol in Small-Pox and Plague.**—*Brit. Med. Jl.* 1914. June 6. p. 1236.

The treatment of bubonic plague (in Mauritius) with intravenous injections of Electrargol (up to 60 cc.) is here recommended. The only cases, however, which appear to benefit by the treatment are bubonic cases in the early stages—up to 48 hours; the course of abubonic [septicaemic] and pneumonic plague not being affected.

Forty-eight cases were under treatment and gave a mortality of 60·4 per cent., as against an untreated series of 313 with an 83·4 per cent. mortality. [The former series does not appear to be large enough to allow any definite conclusion to be drawn in favour of the treatment advised.]

R. St. J. B.

DEVY. **Notes sur l'Emploi à Pnôm-Penh de la Lymphe de Haffkine en Vue de la Prophylaxie de la Peste en 1910.**—*Ann. d'Hyg. et Méd. Colon.* 1914. Apr.-May-June. Vol. 17. No. 2. pp. 417–445.

The employment of Haffkine's prophylactic at Pnôm-Penh (Cambodia) has, on the whole, given very satisfactory results, but from experience gathered during the investigations, it appears that the age of the vaccine is of very great importance, both with regards to the local and constitutional reaction and to the immunity subsequently incurred. The prophylactic used in Pnôm-Penh was prepared at the Pasteur Institute at Saïgon. Vaccines four to six months old were found to be the most satisfactory ; the reaction being very slight and the subsequent immunity extremely good. 983 persons were vaccinated with a vaccine of this order, in 1 cc. doses. None of these subsequently contracted plague, in spite of the fact that many of them were in intimate contact with plague cases. With freshly prepared vaccine, on the contrary, the results were most unsatisfactory, as the patients suffered, some more, some less, with distressing local and constitutional symptoms (lymphangitis, headache, malaise, &c.). The immunity conferred by this vaccine, moreover, compared unfavourably with the older preparation. [The reduction in toxicity in the older vaccine was probably due to the autolysis of the toxic nucleo-protein contained in the bacilli, brought about by enzyme action.] The author recommends giving the prophylactic as a single injection, instead of dividing the dose, as suggested by HAFFKINE himself. The mortality observed in the protected cases at Pnôm-Penh only amounted to 0·14 per cent.

R. St. J. B.

ABBATUCCI. **Notes sur les Accidents observés à la Suite d'Injections Préventives de Sérum Antipesteux de Yersin.**—*Ann. d'Hyg. et Méd. Colon.* 1914. Apr.-May-June. Vol. 17. No. 2. pp. 446–449.

Sixty-five preventive inoculations were carried out on persons dwelling in the neighbourhood of plague houses. [It is not definitely stated where this took place but, presumably, it was in Indo-China.] The anti-plague serum employed was prepared at the Pasteur Institute at Nha-Trang, and was at first given in 10 cc. doses subcutaneously. This dose was subsequently reduced to 5 cc. on account of the appearance of severe reactions with the larger dose. In all the cases in which a clinical history was obtained a distinct febrile reaction was observed, often accompanied with urticaria, lymphatic swellings, lumbago, giddiness and a sensation of heaviness in the extremities. With children, who were given proportionate doses, the reaction was slight or entirely absent.

The reaction could not be considered as anaphylactic, as some of the patients had never been previously inoculated, and the author attributes the condition to " the conflict of an antibody and an incompletely eliminated antigen."

R. St. J. B.

KUNHARDT (J. C. G.). **Plague Prophylactic Measures during the Off-Season.**—*Proc. Third All-India Sanitary Conference held at Lucknow Jan. 19–27.* 1914. Vol. 5. Papers. Suppl. to *Indian Jl. Med. Research.* pp. 126–157.

In this communication, Kunhardt discusses the possibility of the complete eradication of plague from certain districts in India.

The conclusions he arrives at apply, in the first instance, to that portion of the Deccan covered by the four districts, Poona, Ahmednagar, Sholapur and Satara. In former years, when the area in question was extensively infected, it was not to be expected that eradicative, as distinguished from palliative measures would meet with much success, but now with the steadily decreasing intensity of plague epidemics, it is to be hoped that the complete eradication of the disease from extensive areas will prove less and less difficult.

The method advocated consists essentially in rat destruction carried out in a rational and systematic manner during the off-season in those villages in which, from previous experience [see this *Bulletin*, Vol. 4, p. 15], the disease might reasonably be expected to carry over the off-season. From this point of view all villages were charted which showed the presence of plague infection late in the particular plague season under review. Similar figures were then entered for the previous December, in order to indicate which villages were infected for the first time only in January. The charts were carefully studied and the villages considered in turn with regard to local conditions, population, duration of epidemic, &c. The villages were then classified into four groups, viz. :—

Villages which required immediate rat reduction operations :—

(*a*) Where plague is almost certain to survive the off-season.

(*b*) Where plague will probably survive the off-season.

Villages which necessitated more or less careful observation or enquiry :—

(*c*) Where there is a possibility of plague carrying over.

(*d*) Villages which are almost certain to be plague-free.

The conclusions arrived at were checked from the previous plague histories of the villages in question.

By proceeding on these lines it is possible to concentrate attention on those foci of infection in which a properly directed campaign of rat destruction, accompanied by other appropriate measures, would be the most likely to lead to the eradication of plague from the district as a whole.

R. St. J. B.

BROWNING-SMITH (S.). **Rat Destruction and Plague.**—*Proc. Third All-India Sanitary Conference held at Lucknow Jan. 19–27.* 1914. Vol. 5. Papers. Suppl. to *Indian Jl. Med. Research.* pp. 158–161.

The importance of the temporary reduction in the rat population by means of rat destruction is here insisted on, and the best means for carrying such a campaign into effect is discussed. The simplest and most rapid method of reducing the rat population is by poisoning, and if properly carried out an immediate reduction of 80 per cent. should be effected. A cheap and effective bait can be made from phosphorus dissolved in carbon bi-sulphide and then added to warm

ghi; this oily solution is then added to and incorporated with a stiff paste of *atta*, sugar and water in a special mixing machine. Flavouring substances are also added to make the baits attractive. A twelve ounce tin costing about ten annas is sufficient for 1,500 baits.

In two contiguous areas known to be equally susceptible to infection, in a year when plague was universally distributed, a comparison between ratted and non-ratted areas is very instructive. In the ratted area out of 154 villages 75, or about 50 per cent., remained free from infection, whereas in the non-ratted area out of 86 villages not one escaped infection.

It is recognised that rat destruction *per se* does not get to the root of the problem, and that the freedom of a rat infested district from plague is fundamentally a matter of rat-proofing and protection of food. As far as India is concerned, such measures are questions of generations of sanitary progress. Meanwhile rat destruction, which shows signs of falling into undeserved disrepute, ought to be stimulated by every possible means.

R. St. J. B.

Long (J. D.). **Plague Eradication in California. Present Situation. The Disease apparently eradicated.**—*U.S. Public Health Rep.* 1914. Nov. 20. Vol. 29. No. 47. pp. 3103–3107.

Plague was first reported in California in 1900, and cases appeared from time to time till 1904. No cases were reported from 1904 till 1907, when the disease again became manifest. From August 1907, till January 1908, 159 human cases occurred. In August 1908, it was first discovered that the ground squirrels, which infest the rural districts of California, were extensively infected with the disease, and since that time a very vigorous campaign of "decitellization" has been carried on by the United States Public Health Service, working in conjunction with the Local Authorities.

The results of these operations have led to such a reduction of the squirrel population that plague can no longer be discovered, and for all practical purposes it may be said that the epizootic has been completely eradicated from the State. In infected districts intensive hunting has been conducted to such good purpose that upwards of 90 per cent. of the entire squirrel population has been exterminated. Hunting will again be resumed at the commencement of the next breeding season, and if no infection is then discovered, the statement may be made with certainty that no plague exists in the State of California.

R. St. J. B.

Macalister (G. H.) & Brooks (R. St. John). **Report upon the Post-Mortem Examination of Rats at Ipswich.**—*Jl. of Hygiene.* 1914. Nov. Vol. 14. No. 3. pp. 316–330.

Over 15,000 rats were examined by the authors in 1911 on behalf of the Local Government Board. They were nearly all of the *Mus decumanus* species. The object of the enquiry was to ascertain the extent of plague infection in the rat population of the district. Of the total number of rats examined 35 were proved by inoculation to

be infected; 116 rats suspected of plague were shown by inoculation not to be so infected.

In the examinations special, naked eye, observation was directed to lymphatic glands, haemorrhages, effusions into serous cavities, the condition of the liver, spleen and subcutaneous tissue, and where necessary microscopic examination was further resorted to.

The features of greatest service in the diagnosis of plague were the presence of subcutaneous congestion, clear pleural effusion and granular necrotic changes in the liver. All three signs were present in most of the positive cases but only in nine of the large number of negative cases. These signs taken alone are not of such great value as when taken collectively.

Gaertner infections were found in 19 rats and in these cases the liver was not granular but rather peppered with white spots.

Trypanosomiasis was found in 50 rats out of 2,000 examined in the month of August. The condition appeared pre-eminently associated with a blood stained pleural exudate.

Difficulties occasionally arose in the microscopic identification of the plague bacilli, owing to the presence in the organs of intestinal and putrefactive organisms which frequently show similar staining reactions.

W. J. Penfold.

Eastwood (A.) & Griffith (F.). **Report to the Local Government Board on an Enquiry into Rat Plague in East Anglia during the Period July-October, 1911.**—*Jl. of Hygiene.* 1914. Nov. Vol. 10. No. 3. pp. 285–315. With a map.

This report deals with an inquiry, instituted by the Local Government Board some three years ago, into the localisation of rat plague in East Anglia. Epizootic plague had made its appearance in the locality in the summer of 1910, and a delimiting investigation, taking in a belt of country surrounding the known infected area, had been undertaken in the early part of the year 1911. The results of this investigation were negative. It was accordingly decided to prosecute enquiries principally in those districts which had been known by previous experience to be plague infected, and to this end an extensive campaign was organised for the collection of material for examination at the local Laboratory at Ipswich and also at the Local Government Board Pathological Laboratories in London. The investigation commenced in July 1911 with the examination of rats from the Borough of Ipswich, Sanford and Woodbridge R.D., Woodbridge U.D., and Felixstowe and Walton. In the latter part of July six plague infected rats were collected in these areas. The scope of the inquiry was then extended so as to comprise a large field in East Suffolk, a small part of West Suffolk and a strip of Essex adjacent to the south of Suffolk. During the months July-October 1911, 15,332 rats were examined, and as the result of the enquiry, 27 farms and other premises were found to harbour plague infected rats; all the infected foci being within the area previously known to be infected. As soon as a parish was found to be infected the supply of rats was immediately stopped, [so that the number of

plague rats actually found (35) gives no indication of the intensity of the epizootic during the period under consideration.]

[The results of this investigation tend to show that although rat plague appears to have become firmly established in East Anglia, the epizootic had not, at this time, shown any tendency to extend into previously non-infected areas.]

R. St. J. B.

Markl (Jaromir Gottlieb). **Zur Frage der Mutation bei Pestbacillen.** [The Mutation of Plague Bacilli.]—*Centralbl. f. Bakt.* 1. Abt. Orig. 1914. July 25. Vol. 74. No. 7. pp. 529–540. With 10 text figures.

The original cultures used in these experiments were obtained from four weeks' old agar plates which had been inoculated from buboes, blood and spleen from cases of human and rat plague. On examination of this material, three different kinds of plague colonies were observed, which are designated by the author as Types A, B and C respectively. The Type A colonies are described as extremely delicate, translucent, colourless, coarsely granulated colonies with strongly scalloped edges. They were adherent to the culture medium and did not exhibit the typical slimy and stringy conditions so frequently met with by plague workers. Type B were large colonies with slimy, yellowish centres standing out in bold relief, with bluish transparent indented edges. Type C were small, roundish dew-drop like, opaque colonies, without border. Types B and C correspond with Types I and II, previously described by Albrecht and Ghon.

The A-strain represents the youngest form of colony, as it is in evidence during the first 24 hours on all cultures; the other types originate from the A colonies, either directly or through intermediate forms. These types do not, as a rule, exhibit hereditary constancy, and cannot therefore be described as true mutations.

It is concluded that the B and C forms are called into being by adverse conditions of growth (drying or exhaustion of media, toxins &c.), and may be regarded as conservative forms awakened by the needs of race preservation. This point is emphasized by the fact that the B and C forms originate spontaneously on pest inoculated culture media to which plague toxin has been added previously, while the control plates (without toxin) exhibit A colonies which change over into B and C colonies after a variable period.

Of the three races the A race is the most virulent. Three series of mice were inoculated with 24 hour broth cultures of the three strains (1:10, 1:100 and 1:1000 oese). The animals all died within three days, but while the bacilli recovered from the blood of the mice inoculated with the B and C strains were very scanty, the A-strain mice revealed the presence of a heavy septicaemia.

Morphological differences were also observed. The B and C strains cannot be thus differentiated, as they both appear as cocci-bacilli, but the A race organisms are longer, ovoid and uniformly staining. When introduced into the animal body the B and C strains become elongated and take on the morphological characteristics of the A-strain.

R. St. J. B.

Wilson (Robert J.). **The Viability of the *B. pestis* in Stock Cultures.** *Collected Studies from the Bureau of Laboratories, Dept. of Health, City of New York*, 1912–13. Vol. 7. p. 109.

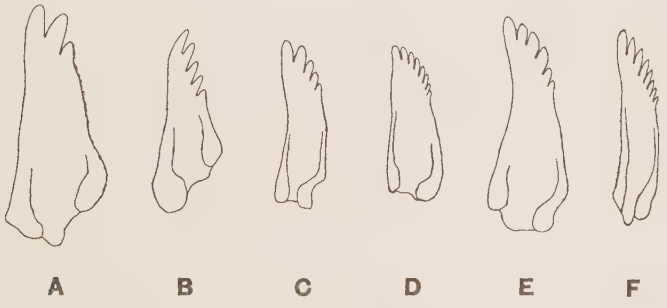
Plague cultures kept for a period of ten years and five months were examined and, on subculturing, an abundant growth of *B. pestis* was obtained after 48 hours. These organisms proved fatal to guinea-pigs in two days, and pure cultures were recovered from the heart blood.

R. St. J. B.

Bacot (A. W.) & Ridewood (W. G.). **Observations on the Larvae of Fleas.**—*Parasitology*. 1914. June. Vol. 7. No. 2. pp. 157–175. With 6 text-figs.

The above paper forms a valuable contribution to the scanty literature on the larvae of Pulicid fleas. Much new ground is broken, and for the first time the differential morphology of the larvae of the more important species is placed on record.

Eggs laid by the female flea take from three to ten days to hatch out, according to temperature [see this *Bulletin*, Vol. 3, p. 204], and the resulting larvae after two moults, spin cocoons in which they pass a quiescent period prior to pupation. The authors call attention to the fact that the newly hatched larvae possess a curious chitinised appendage (egg-breaker) by means of which the grub slits open the egg-shell at the end of the incubation period; after the first moult this appendage disappears. The chief food supply of the larvae of fleas appears to be the excreta of their parents; one species, indeed, (*Ceratophyllus fasciatus*) requires such excreta for satisfactory growth in captivity. Other larvae, however, can subsist on dry organic fragments.



Mandibles of Larvae of Fleas (× 300). W.G.R. *A. Pulex irritans*; *B. Xenopsylla cheopis*; *C. Ctenocephalus canis*; *D. Ceratophyllus fasciatus*; *E. Ceratophyllus gallinae*; *F. Leptopsylla musculi*. All drawn by camera lucida with apochromatic objective 4 mm. and compensating ocular No. 4, and subsequently reduced to three-fourths; it is to be noted, however, that in different full-grown larvae of the same species the mandibles vary considerably in size.

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The morphological characters of the six species dealt with are quite distinctive, the principal points of differentiation being the structure of the first maxillary palps, the character of the terminal somites, the shape of the head and the number of teeth on the mandible. Some of the more important of these characters are summarised in the following table :—

Species.	1st Maxillary palp.	Anal struts of terminal somites.	Snout as viewed from above.	Number of teeth on mandible.
Pulex irritans	Type A.	Thin, curved, tapering ..	Medium	3
Xenopsylla cheopis ..	,,	As *P. irritans*, but blunter	Narrow	5
Ctenocephalus canis ..	,,	As *P. irritans*, but smaller	Medium	6
Ceratophyllus fasciatus...	Type B.	Thick, straight, slightly tapering, blunt end ..	Broad	8
Ceratophyllus gallinae ..	,,	As *C. fasciatus*	,,	6
Leptopsylla musculi ..	,,	As *C. fasciatus*, but smaller	,,	8

Type A. Basal joint short and broad; second joint narrow at base and obliquely truncated.

Type B. Basal joint cylindrical, twice as long as broad; second joint cylindrical and rounded at extremity.

Six figures appear in the text emphasizing the variations in structure met with in the different species under consideration.

R. St. J. B.

Swellengrebel (N. H.). **Versuche und Beobachtungen über die Biologie von *Xenopsylla cheopis* in Ost-Java.** [The Biology of *X. cheopis* in East Java.]—*Centralbl. f. Bakt.* 1. Abt. Orig. 1914. July 16. Vol. 74. No. 5/6. pp. 456–466. With 2 text figs.

In this paper are collected together the results of the author's observations on the biology of *Xenopsylla cheopis* in East Java. In some particulars they differ from the findings of the Indian Plague Commission, notably in respect to the length of time that elapses before a fasting flea will bite man. In his experiments, which were conducted with caged rats and guinea-pigs, within a dwelling-house with a concreted floor, it was found that man was readily attacked on the first day of fasting. Under the same conditions as obtained in the investigations by the Indian Plague Commission, where large numbers of fleas were collected in test tubes and subsequently allowed to feed on the human arm, it was found that similar results were obtained, *i.e.*, the fleas did not bite freely till the third day of fasting. In Surabaya the life of a flea away from its host appears to be much shorter than in other situations in East Java.

With regard to the different stages of development of the flea, it was ascertained that the time period of egg incubation was significantly influenced by the hygrometric state of the atmosphere. Other things being equal, the greater the percentage saturation, the greater

the percentage of eggs that hatched out. Attention is drawn to the fact that in Surabaya an unfavourable influence exists which is inimical to the development of the larvae of *X. cheopis*. This unfavourable influence is dependent on an unknown factor, which cannot be explained on the grounds of temperature or relative humidity.

R. St. J. B.

Van Driel (D. M.). **Naar Aanleiding van "Pestbestrijding te Shanghai en Pestbestrijding op Java" door Dr. O. L. E. de Raadt.** [Remarks induced by "Anti-plague Measures in Java and Shanghai" by Dr. de Raadt.]—*Geneesk Tijdschr. v. Nederl.-Indië.* 1914. Vol. 54. Pt. 3. pp. 338–345.

Van Driel in this communication, in reference to certain criticisms by de Raadt [see this *Bulletin*, Vol. 4, p. 25], states that while he is in agreement with the author as to the great importance of epidemiological factors in the combating of plague epidemics, he is of opinion that the practical side of the question has been overlooked in Java, and to a certain extent in Shanghai.

He contends that Public Health services might well limit themselves to investigation based upon firmly established principles, without personally engaging in the study of more or less "academic and theoretical questions."

R. St. J. B.

MALARIA.

Ross (Ronald). **The Huxley Lecture on Recent Advances in Science and their Bearing on Medicine and Surgery. Malaria and the Transmission of Diseases.**—*Lancet.* 1914. Nov. 7. pp. 1079–1084.

In this lecture Sir Ronald Ross, after some general remarks on the transmission of disease and a reference to early investigations and later discoveries, turns to the subject of malaria. He quotes statistics to show that as a broad general rule in malarious countries about one-third of the total population suffers from attacks every year, and that about one-third of the admissions to hospital and attendances at dispensaries is due to malaria. There is, however, an enormous additional number of patients who remain untreated, as is evident from a consideration of the spleen rate of native children which in very unhealthy regions may be 100 per cent. Economically as well as medically malaria is certainly the most important disease in the tropics, perhaps in the world, though the case mortality is only about 0·5 per cent. It is, however, so prevalent that the total mortality which it causes amounts to anything from 10 to 15 per 1,000, while it complicates other maladies and makes them more difficult to treat. In India alone during ordinary years the total deaths from malaria average 1,300,000 annually.

Ross then considers the old views as to the etiology of the disease and traces the development of what, until comparatively recent times, was only the mosquito theory. [In this connection the name of Beauperthuy might have been given honourable mention, for his work was at least as meritorious as that of King, and he wrote long before the latter.]

The author then deals with his own historic work which converted theory to fact and, as he points out, paved the way for advances in other directions. He concludes by expressing disappointment with the paucity of the efforts which have been made to take full advantage of his discovery, although he admits that in certain places much has been accomplished, an earnest of benefits to come.

A. Balfour.

Gill (Clifford A.). **Epidemic or Fulminant Malaria, together with a Preliminary Study of the Part played by Immunity in Malaria.**—*Indian Jl. Med. Research.* 1914. July. Vol. 2. No. 1. pp. 268–314. With 3 maps and 3 charts.

This long and valuable paper is best summarised by quoting the author's tabular statement of conclusions grouped under six headings. These are as follows :—

"(A).—*General.*

"(1) Endemic malaria may be divided into (*a*) Tropical malaria; (*b*) Sub-tropical malaria.

"(2) Malaria may manifest itself in epidemic form as (*a*) Fulminant malaria; (*b*) Generalised epidemic malaria; (*c*) Localised epidemic malaria.

"(3) Fulminant malaria is ordinarily a manifestation of sub-tropical malaria.

"(4) The principle underlying the occurrence of these various manifestations of malaria is closely related to the subject of immunity.

"(B).—*Malarial Immunity.*

"(5) Immunity in malaria appears ordinarily to be an acquired partial immunity which manifests itself as a relative tolerance to the effects of malarial infection.

"(6) Whilst the protection afforded by a single infection is slight and not long maintained in the absence of reinfection, a high degree of tolerance to malarial infection is brought about as the result of *repeated inoculation* with fresh parasites.

"(7) In circumstances where perennial infection may occur the collective immunity of a community tends ordinarily to remain fairly constant, whilst it is subject to marked fluctuations in localities where the transmission of infection remains in abeyance over prolonged periods.

"(8) All epidemic manifestations of malaria are ultimately dependent upon 'equilibrium' between the degree of immunity and the amount of infection being temporarily disturbed or lost.

"(9) The spleen-rate of a community may be utilised as an index of the tolerance to malaria possessed by that community; a spleen-rate remaining constant over a period of years ordinarily signifies a constant immunity, whilst a fluctuating spleen-rate implies corresponding oscillations in the degree of immunity possessed by the community.

"(C).—*Tropical Malaria.*

"(10). Tropical malaria is associated with conditions which render possible the transmission of fresh malarial infection almost throughout the whole year. In such circumstances tolerance to infection remains fairly constant and there is little or no tendency for pernicious forms of malaria or for fulminant epidemics to occur *amongst the indigenous inhabitants.*

"(11) The spleen-rate of such communities ordinarily remains fairly constant and, in addition to affording evidence of the endemic prevalence of the disease, its constancy over a period of years indicates that the immunity of the community likewise remains fairly constant.

"(12) Generalised or localised epidemics of malaria may occur in tropical countries as the result of conditions causing a marked temporary increase in the amount of local infection.

"(13) An epidemic of a fulminant nature may follow the introduction of malaria into non-endemic tropical areas, but such epidemics may not be expected to recur after the disease has established itself in its new habitat.

"(D).—*Sub-Tropical Malaria.*

"(14) Endemic malaria occurring in localities in which owing to climatic circumstances the active transmission of malaria is subject to prolonged periods of interruption constitutes sub-tropical malaria. In these areas, owing to the mechanism of malarial immunity "equilibrium" between infection and immunity is maintained with more difficulty than in tropical countries.

"(15) Marked spontaneous fluctuations in the spleen-rate over a period of years are of frequent occurrence in connexion with sub-tropical malaria.

"(16) The use of the terms 'healthy,' 'moderately endemic,' 'highly endemic' and 'hyper-endemic' to indicate spleen-rates of various percentages may be inapplicable in the case of sub-tropical malaria. In these circumstances the *periodical* estimation of the spleen-rate and the calculation of its 'percentage reduction' over a period of years will afford information of considerable value.

"(E).—*Fulminant Malaria.*

"(17) Fulminant malaria is apt to occur in localities where the active transmission of malaria is annually subject to prolonged periods of interruption.

"(18) 'Interruption' of infection is associated with a decrease in tolerance to malarial infection, as the result both of the absence of reinfection and of the elimination of residual infection.

"(19) A fulminant epidemic occurs in circumstances in which a great relative decrease in immunity is associated with a marked temporary increase in the amount of infection.

"(20) *A great decrease in relative immunity* occurs in areas where the physiographical conditions are normally so unfavourable to endemic malaria that the spleen-rate spontaneously undergoes a great diminution during a short period of years.

"(21) *A marked temporary increase in the amount of infection* may occur periodically in such areas as the result of excessive rainfall and 'flooding' producing conditions abnormally favourable to the malaria parasite and to its transmission from man to man.

"(22) The exact significance of flooding still remains to be elucidated, but it is probable that the unusual facilities that it affords for the multiplications of anophelines is not its sole influence.

"(23) The immunity conferred by a fulminant epidemic slowly disappears, but may become greatly reduced in about five years. As the result of this circumstance fulminant epidemics may be expected to occur usually at intervals of not less than the above period.

"(24) A *relatively* high spleen-rate compared with other areas affords no protection against a fulminant epidemic as it is not the height of the spleen-rate but the *amount of reduction* it has undergone that is of paramount importance.

"(25) A low spleen-rate in an area subject to fulminant malaria may have a widely different significance to a similar spleen-rate in a tropical country. In the case of the former a fulminant epidemic may be anticipated to follow the next occurrence of flooding, whilst in a tropical area no such effect will be produced.

"(26) Fulminant malaria is more particularly the result of infection with the malignant tertian or tropical parasite.

"(27) The mitigation and even prevention of fulminant epidemics may be predicted to follow the carrying out of measures designed to prevent the occurrence of flooding.

"(F).—*Epidemic Malaria.*

"(28) Epidemics of malaria, either generalised or localised, may occur in any part of the endemic area of malaria without reference to climatic circumstances. They are associated with conditions which either *temporarily* increase the amount of local infection or lower the immunity of the community and more particularly with conditions which do both.

"(29) In spite of the mutual dependence of these epidemics and fulminant malaria on loss of 'equilibrium' between the amount of infection and the degree of immunity, the fact that they possess no other characteristics in common renders it expedient to differentiate them from one another."

[It is obvious that a paper of this nature requires careful and detailed study. The use of the term "Tropical Malaria" as a division of Endemic Malaria, and with an epidemiological significance, appears to be rather a mistake, for most students regard tropical malaria as the form due to *P. falciparum*, and employ it in a clinical sense. At the same time, the author clearly explains what he means by it.

His review of the literature, though very extensive, is not always accurate. For example, after stating that it is a matter of surprise that no undoubted evidence of fulminant epidemics has been forthcoming from the Nile delta, he quotes the reviewer as saying that at Khartoum locally acquired malaria is rare, whereas the sentence should read "is *now* rare." It is chiefly, if not wholly, due to anti-mosquito measures that malaria is no longer common there.]

Three maps showing respectively the site of epidemic areas in India, the known distribution of fulminant malaria throughout the globe, the annual average period during which in India the active transmission of malaria remains in abeyance (Hill stations excluded), aid the reader in his study of what is undoubtedly an important contribution to the epidemiology of malaria. A. B.

GILL (C. A.). **Note on the Value of the Parasite-Rate in the Measurement of Malaria.**—*Proc. Third All-India Sanitary Conference, held at Lucknow, Jan. 19–27.* 1914. Vol. 4. Papers. Suppl. to *Indian Jl. Med. Research.* pp. 18-22. With a chart.

After pointing out that the spleen rate of a community is more easily ascertained than the parasite rate, and that it also furnishes a more reliable estimate of the prevalence of malaria than the latter, the author describes the investigations he conducted during a malarial survey of Amritsar City in November 1913, and tabulates his results as regards both rates. He divided his splenomegaly cases into six classes, according to the degree of splenic enlargement present.

His conclusions are :—

"(1) As an index of the amount of malaria in a community the parasite-rate is of less value than the spleen-rate.

"(2) The benign and subtertian parasites in certain parts of Northern India show well marked seasonal variations.

"(3) Whereas benign infections reach their maximum in June, subtertian infections are most prevalent in the autumn.

"(4) In view of these seasonal variations the parasite-rate in any community will depend to a considerable degree on the period of the year when the blood examinations are made.

"(5) In consequence of the above no definite relationship in Northern India can be expected to exist between the spleen and parasite rates; nevertheless, when the spleen-rate is high, the parasite-rate will usually tend to be high also.

"(6) In only 19 per cent. of the children in Amritsar with palpable spleens were malaria parasites discovered in November, 1913, and the *degree* of enlargement did not appear to affect appreciably the chances of finding parasites in their blood at this time.

"(7) In view, however, of the seasonal variation in the prevalence of malarial parasites no deductions can be drawn in regard to the effect of splenic enlargement on the parasite-rate at any other time."

A. B.

PERRY (E. L.). **Recent Additions to our Knowledge of Malaria in the Punjab.** (A paper read before the Punjab Branch of the British Medical Association at Simla, on July 17th, 1914.)—19 pp. With 1 chart. 914. Simla. Printed by Thacker, Spink& Co.

The author affirms that the greatest problem that faces the Sanitary Department of the Punjab is how to deal with malaria. This is evident when one recalls that the great epidemic of 1908 caused in a few months the deaths of far more than a quarter of a million persons.

Much has been done since that time, and a part of the present paper is taken up with a consideration of CHRISTOPHERS's investigations into fulminant epidemics. CHRISTOPHERS showed the part which floods play in the etiology of such epidemics, and proved that irrigation has no special relation to their mortality distribution. He also held that one of the factors which predisposes the community to suffer from a fulminant epidemic is shortage of food, the result of deficient rainfall.

Perry took up the investigation where CHRISTOPHERS left it, and conducted a study of the malaria of the community in the period between epidemics.

He has been able to show that in the Punjab the prevalence of the malaria parasite and the prevalence of splenomegaly are both subject to an enormous degree of fluctuation. There is a great contrast between the Punjab and countries where malaria is constantly and highly endemic. A chart shows the fall in spleen rate which took place in the Gujrat district after the 1908 epidemic, and it was the observations which led to its construction that convinced Perry that he was wrong in supposing that those parts of the Punjab which suffer periodically from epidemic malaria normally exhibit a high degree of endemic malaria. The chart shows that by 1912 the spleen rate had fallen to 20 per cent., the parasite rate to about 8 per cent. and the crescent rate practically to zero. As the author points out, these remarkable results show how dangerous it would be to dogmatise on the effect of anti-malarial measures in the Punjab unless the observations were continued throughout many years. Perry believes that his investigations must engender a hopeful spirit.

As he says :—

"If in these areas, subject to epidemic visitations, endemic malaria was very severe, the task of dealing with malaria might appear well-nigh hopeless. But when we study such an area and discover that, far from what we had originally supposed, in the absence of epidemic conditions, such an area can become comparatively healthy, and when we also remember that even in severe epidemic years such an area may escape a visitation, we realise then how preponderating is the effect of the exciting cause of an epidemic. I feel convinced from the evidence CHRISTOPHERS has collected, that the great exciting causes of these epidemics are floods. If I am correct I think you will all agree that, judging from great achievements in the Punjab in the past, the genius of our engineers will some day devise means of controlling these disastrous floods."

He has some interesting remarks to make on racial immunity and racial differences, comparing for this purpose the conditions present in such a centre of endemic malaria as the Jeypore Hill country in the Madras Presidency, where the aborigines present a different clinical picture to the immigrants, with those found in the Punjab, where the races may be termed non-immunes. As he promises a further paper on this subject, it need not be discussed here in detail, but his remarks should be studied by those interested in the epidemiology of malaria, which of late years has attracted more attention in India than anywhere else. A. B.

KENRICK (W. H.). **Malaria and Rice Cultivation.**—*Proc. Third All-India Sanitary Conference held at Lucknow, Jan. 19–27.* Vol. 4. Papers. Suppl. to *Indian Jl. Med. Research.* pp. 64–70.

At the instigation of the General Malaria Committee, Major Kenrick

instituted an enquiry in the Central Provinces as to the conditions under which rice cultivation proves harmful by favouring the spread of malaria. There is a large and increasing area under rice, and the author describes its physical features, its climate, the type of irrigation employed and the method of cultivation, which is almost universally "broadcast sowing," and not transplantation. It is to be noted that the irrigation is merely additional to the rainfall, and hence is more frequently employed in the case of light, non-retentive soils.

The tanks are an important feature, and usually contain water weeds, grass and fish of several species. No less than 30,000 children between the ages of two and ten years had their spleens examined, and the rate in the healthy (open plains country) which worked out at 4·3 per cent., is compared with the 24·1 per cent. found in the endemic areas which are invariably in the neighbourhood of jungle, long grass, forest, thick vegetation and undergrowth, *i.e.*, in the proximity of shade.

Suitable breeding grounds for anophelines are also an essential factor in the production of these unhealthy areas. The following species are found: *A. fuliginosus, A. fowleri, A. culicifacies, A. rossi, A. sinensis, A. maculipalpis, A. barbirostris, A. punctulata.* Blood examinations were also conducted, and the findings in 400 films classified according to the degree of splenic enlargement. The quartan parasite was found to be associated with the higher degrees of splenomegaly, and a much higher percentage of parasites was found in the cases with moderately enlarged spleens than in those where the enlargement was great. Irrigation and shade are the two factors which make for danger, and it is therefore very important that the channels should be as open as possible, and that anything in the form of shade-yielding vegetation should be cleared away. A. B.

Marjoribanks (J. L.). **Report on Certain Features of Malaria in the Island of Salsette.**—*Proc. Third All-India Sanitary Conference held at Lucknow, Jan. 19–27.* Vol. 4. Papers. Suppl. to *Indian Jl. Med. Research.* pp. 23–63. With 2 charts and a map.

Salsette is an Indian island not far from Bombay, and in this very careful and exhaustive paper, furnished with a map, charts and tables, the author gives an account of the malaria and the malarial conditions found upon it. Naturally these are chiefly of local interest, and it will be sufficient to state that, after a general description of Salsette, in the course of which he mentions the trees and crops as well as the climate and rainfall, he discusses the vital statistics at some length, and then enters fully into the question of the indigenous anophelines.

Thereafter he considers the results of a spleen census which he conducted, and finally concludes the main paper with a series of useful and practical recommendations.

Some of these may be mentioned. Speaking of the immunity enjoyed by those villages which are swept by the sea-breezes, he suggests that it might be advisable to attack the resting places of mosquitoes, especially as, with the exception of certain borrow-pits, it is not possible to deal with their breeding places.

Elsewhere he advocates the provision of a travelling dispensary as the only way to keep attention constantly fixed on the state of the children's spleens.

He is also careful to consider the question of new building areas, which is inseparably associated with the provision of efficient means of communication.

One of the three appendices is rather out of the common in that it gives minute instructions for the capture and breeding-out of larvae, details the apparatus used, furnishes an example of a record chart or register and supplies directions for the use of searchers.

[In this connection one finds no mention of the useful collecting tin with half its bottom replaced by wire mesh, introduced long ago by St. George Gray, while it may be stated that in any record chart it is very advantageous to have entries stating whether eggs, larvae, pupae or empty pupal shells were found.]

This report is a very full and careful one, and if all areas likely to undergo development were surveyed in this fashion, and the necessary action taken, great benefit would result and both lives and money would be saved. A. B.

Horne (J. H.). **Malaria in Wynaad.**—*Proc. Third All-India Sanitary Conference held at Lucknow Jan. 19–27.* 1914. Vol. 4. Papers. Suppl. to *Indian Jl. Med. Research.* pp. 71–74.

Wynaad, a hilly plateau in the Nilgiri hills, lying at an elevation of 3,000 feet, has long been regarded as one of the worst fever areas in Southern India.

As Captain Horne shows, this is explained by the presence of numerous swamps with streams emerging from them. He found it difficult to obtain adult anophelines owing to the nature of the house interiors, which were dark and lofty, but anopheline larvae were present in abundance, and the list of those bred out and determined is given. Eleven species were recognised.

Spleen and parasite rates were taken both in the villages and on the estates. The results are tabulated, but scarcely require detailed consideration. A. B.

De Mello (Froilano). **Contribution to the Study of Malaria in Gôa.**—*Proc. Third All-India Sanitary Conference held at Lucknow, Jan. 19–27.* 1914. Vol. 4. Papers. Suppl. to *Indian Jl. Med. Research.* pp. 1–14.

Malaria is endemic in Goa, and hitherto anti-malarial measures have made no great progress, chiefly because the medical men there have too much other work to do, and there is also a lack of inclination and personal enterprise. The author's account of the disease in Goa is purely of local interest. It may be noted that it is usually benign, though widespread. Certain localities, including the capital, Nova-Goa, which were once notoriously malarious, are now very healthy. This appears to be due to systematic quininisation, which, the author suggests, may have attenuated the virulence of the malarial parasite. [In Brazil it is believed that prolonged quininisation has resulted in the production of a quinine resistant strain which may possess considerable virulence.]

Anti-malarial regulations have been drawn up by the Board of Health, and are detailed by Dr. Mello. If they can be carried into effect, they should be productive of much benefit A. B.

Hodgson (E. C.). **A Preliminary Note on Malaria in Madras City.**—*Indian Jl. Med. Research.* 1914. Apr. Vol. 1. No. 4. pp. 703–706. With a map.

Madras is a curiously scattered city covering 27 square miles, and situated on a low-lying strip of sandy soil facing the Bay of Bengal. Its greatest length is 9 miles, the greatest breadth 3½ miles, so that most of it faces the sea. The author describes the topographical conditions as follows :—

"The land on which the city is built is extremely flat, the highest point being only some twenty feet above the mean sea-level, while large areas of the town are only some five feet to six feet above the level of the sea at high tide. The difficulties in dealing with drainage problems will be appreciated when it is realised that the average depth of the sub-soil water is two feet above the mean sea-level, and in the rainy season it rises another two or three feet. The consequence is that in some parts of the city, at the end of the rains, the surface of the soil is scarcely a foot above the sub-soil water-level, and almost any depression in the land in these areas is bound to contain water for many weeks on end until the sub-soil water-level sinks again. When I first took over my new office, situated in one of these depressed areas, I noticed some shallow pools lying among grass in the compound in which some young anopheline larvae were breeding. I ordered some of my staff to bale these pools out. They completely failed to do so. The depressions were below the sub-soil water-level, and as fast as the men baled out, fresh water ran in. The monsoon, an exceptionally heavy one, had just ended."

It is generally believed by the inhabitants that malaria is quite a new feature in the history of Madras, but opinions differ as to the date of its origin and the causes of the initial outbreak.

In 1913 Hodgson made a spleen census of the city, examining 4,000 children under ten years of age. His results are shown on a map which is reproduced, as the graphic method he employs is an ingenious and useful one. He thinks the indications point to the northern part of the town having been much longer affected than the southern. The latter seems only to have been attacked during the last year or so, a view supported by the hospital returns.

After a further consideration of local conditions, the author says :—

"We have, therefore, a city with an extremely high sub-soil water, many temporary sheets of water, rice fields, tanks and wells. Young anopheline larvae, at any rate, are to be found in them, and yet until recent years, and even now in the greater part of the city, very little malaria has been present. Judging from the present epidemic conditions in both the northern and the southern ends, and to a less extent in the west, the city can suffer severely from malaria. The total death-rate from fever has been only five or six per thousand per annum, a mere trifle compared to that of the cities of Northern India."

That malaria carriers are not lacking is shown from the list of anopheles found breeding in Madras :—(1) *A. ludlowi*, (2) *A. barbirostris*, (3) *A. nigerrimus*, (4) *A. jamesi*, (5) *A. fuliginosus*, (6) *A. culicifacies*, (7) *A. rossi*, (8) *A. stephensi*. Of these, *A. ludlowi* was found by Captain Horne, I.M.S., to be harbouring the malarial parasite.

Hodgson suggests that one of the reasons why malaria has not spread more rapidly in Madras is that the surfaces of exposed sheets of water are too hot to serve as suitable breeding grounds for anopheline larvae.

From his concluding paragraph one may expect that a future communication upon what is an interesting problem will follow in due course.

A. B.

E. C. Hodgson.]

MAP OF MADRAS.
0 1 2 Miles.
N
TONDIARPET.
PERAMBUR.
EGMORE
VEPERY
NUNGAMBAKAM
TRIPLICANE
GEORGE TOWN
HARBOUR
FORT ST GEORGE
BAY OF BENGAL
MYLAPUR
88%
30%
60%
22%
20%
5%
2%
5%
17%
11%
6%
9%
7%
6%
15%
6%
3%
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2%
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1%
30%
27%
36%
74%
4%
68%
1%
11%
4%
7%
4%

Smart (A. G. H.). **Epidemic Malaria and Construction Works.**—*Trans. Soc. Trop. Med. & Hyg.* 1914. July. Vol. 7. No. 7–8. pp. 251–258. With a sketch plan.

An account of the conditions resulting in an outbreak of malaria amongst coolie gangs employed upon construction works in connection with a water supply scheme in Kedah (Malaya). Most of the cases were benign tertian or sub-tertian, but a few were quartan. The chief cause of the outbreak was not, as might have been expected, interference with the stream, the level of which, already low, was still further depressed by the engineering operations. These consisted in the formation of a dam which diverted the waters of the Terjun River into a large concrete settling tank. As a result, the river-bed below the dam was nothing but a series of shallow pools containing decomposing vegetation. These pools, however, did not harbour anopheline larvae, but only those of *Culex ager*. On the other hand, before the stream had been diverted larvae of several species of anophelines were found both above and below the dam.

Those of *A. leucosphyrus* and *A. kochi* were taken from pools at the edge of the stream, those of *A. sinensis* from an algae-covered pool, while the larvae of *A. maculatus* and *A. karwari* were obtained at the edge of the running stream. The author points out that the last two species tend to occur along with the larvae of *Uranotaenia campestris* which, as Finlayson has noted, act as good indicators of places where these anopheline larvae are likely to be found even when the latter are not present at a first examination.

Other breeding places for the larvae of *A. maculatus* were the leakage pools from service pipes. A sketch plan of the Alor Star waterworks, showing the site of the coolie lines, helps the reader to understand the local conditions described.

A. B.

Williams (Tom A.). **Cerebellar Dysergia from Malarial Thrombosis, with Remarks on the Clinical Forms and Pathology of Pernicious Malaria affecting the Nervous System.**—*Southern Med. Jl.* 1914. Oct. Vol. 7. No. 10. pp. 793–794.

An account of a case which, owing to the presence of a dysergic intention tremor, slowness of speech, exaggerated reflexes with paraesthesiae and a history of blindness with rapid recovery of sight, suggested multiple sclerosis. This was negatived by the very slight progressiveness of the symptoms and the absence of nystagmus and plantar extension. There was as much difficulty in standing with the eyes open as when they were closed which, with other symptoms showing that efferent impulses were imperfectly measured owing to defect in the central apparatus, excluded tabes dorsalis.

The positive signs of dysmetria indicated a lesion of one of the efferent cerebellar functions, and the permanency of this symptom showed that there had been actual destruction of a portion of the cerebellar apparatus.

The author discusses the cause and decides that the symptoms were probably due to multiple malarial thromboses of the intracranial vessels, resulting in areas of necrosis.

The patient, an American journalist, aged 38, suffered from pernicious malaria during the Cuban war, and the following year the symptoms began to show themselves, i.e., a numb feeling in hands and feet, dysmetria, slow speech, loss of vision with rapid recovery of sight, a heavy feeling in the back and soreness of the spine. He was apt to fall down when walking in the street, and his skill in typewriting had greatly suffered. The Noguchi-Wassermann test was negative, and there was no lymphocytosis of the cerebro-spinal fluid. No parasites were present in his blood a month before the author saw him.

Williams points out that the condition is unusual, for pernicious cerebral malaria is either fatal at the first attack or in a relapse, or, under proper treatment, recovery occurs which is complete.

[Unfortunately the author does not state exactly how long after the malarial attack the nervous symptoms began—a matter of considerable importance in view of his conclusions.]

A. B.

Dowden (R.). **Three Cases illustrating Unusual Sequelae of Malarial Fever due to** *Plasmodium falciparum.—Indian Med. Gaz.* 1914. July. Vol. 49. No. 7. pp. 260–263.

Two of the three cases recorded possess a medico-legal interest. The other, which was an example of severe *P. falciparum* infection in a Burmese woman, shows how the effects of malarial cerebral lesions may persist, for, though the patient under appropriate treatment recovered from the malarial attack, she was left with complete motor aphasia. She understood all that was said to her but could not utter a sound. The condition still persisted after six weeks. The patient then left the hospital and her subsequent history has not been traced.

In the medico-legal cases insanity showed itself as a sequel to the malarial attack. In one instance a quiet and elderly Chinese developed homicidal tendencies as a result of chronic malaria with febrile accessions; in another a coolie, also the victim of chronic malaria, who was in addition a sexual degenerate, became depressed and weak-minded. He suffered from ordinary hallucinations, and his habits either became more depraved, or he imagined they had become so. He improved under treatment.

[These cases are of interest, as the forensic aspects of tropical medicine have not received the attention they merit.]

A. B.

Clarenc (H.). **Les Méthodes d'Administration de la Quinine.**—*Bull. Soc. Méd. de l'Ile Maurice.* 1913. Oct.-Nov.-Dec. Vol. 31. 2me Serie. No. 34. pp. 51–62.

*Clarenc, as the result of 45 years' clinical experience in Mauritius, is a strong upholder of the value of intramuscular injections of quinine. He criticises the view of Rogers upon this subject and, in opposition to the work of MacGilchrist, cites that of Webb [see this *Bulletin*,

* This review replaces that published in this *Bulletin* Vol. 4, p. 93, where a remark on the use of neem made by Vinson is attributed to Clarenc.

Vol. 1, p. 649.] He has found again and again that when quinine given, according to various methods, by the mouth has failed, intramuscular injections have succeeded. He prefers to employ the sterile quinine solutions as supplied ready for use in ampoules, and has recourse to the injection method whenever he is satisfied that the case is one which is unsuitable for oral administration. He admits that the latter is simpler and, taking everything into consideration, less dangerous than the injections but, like many others, he has been forced to have recourse to the needle, and he cites cases exemplifying the necessity of employing this mode of medication. The dose which he administers varies from 50 to 75 centigrammes of the bihydrochloride according to the case.

The following is his method of using quinine as a prophylactic.

1. When the febrile attacks are intermittent and recur at short intervals at the same time, the quinine should be given on the days when the fever is due and should be continued in full doses for three weeks to a month.

2. If the febrile attacks are irregular the quinine should be given in single doses every four hours, or in double doses every eight hours for a period of forty-eight hours following the last attack. Thereafter the drug is given six-hourly for another forty-eight hours; then, according to age, the patient takes from 25 to 50 centigrammes for three weeks to a month.

At the same time, after citing the view of Sir Ronald Ross that quininisation should be continued for three months in order to effect a radical cure, he admits that a longer period than a month may be required, and states that each case must be judged on its merits.

He concludes his paper with some notes testifying to the efficacy of a preparation known as the opiate and pills of Gaffard d'Aurillac which, from what he says, would appear to be useful in the class of case which is often benefited by Warburg's tincture.

A. B.

Gilbert (L. F.). **The Treatment of Malaria. Opinions asked for.** [Correspondence].—*Indian Med. Gaz.* 1914. Aug. Vol. 49. No. 8. **p. 331.**

A letter, the burden of which is, "What is the proper treatment of malaria?" The author suggests that in order to decide on the right dose and the correct method of administration, some definite proof of cure or infection is required, like the Wassermann test for syphilis. He asks if this is beyond our laboratory experts. [He may be referred to this *Bulletin*, Vol. 2, p. 557.]

He then gives an account of his own methods. For serious cases he employs intravenous injections, giving seven grains of quinine bihydrochloride boiled in 20 minims of the water which is handiest. He repeats the dose in four hours, and again in four hours, giving twenty-one grains in all.

He has an experience of about two hundred of these injections, none of which caused any unpleasant symptoms. He asks if they are dangerous, if the dilution is too small, if there are records of danger. [Again he may be referred to this *Bulletin*, Vol. 2, p. 324, and also to

a paper by THAYER in the *Bulletin of the Johns Hopkins Hospital* (1911, see Second Review, Wellcome Tropical Research Laboratories, Khartoum, 1911.]

In ordinary cases he was accustomed to order five grains of the sulphate thrice daily, always prescribing it in solution when fever was present or the digestion was upset. Latterly, as his patients have often returned with malaria, due either to re-infection or to relapse, he has increased the dose to ten grains thrice daily. This is continued for fourteen days. Then twenty grains a day are given for a month, and then ten grains a day for another month, together with an iron and arsenic tonic. He admits that this procedure is purely empirical, and passes on to discuss intramuscular injections. He thinks they are indicated during the fever when the patient is very much upset, and he uses them himself in cases which suffer from slight fever or malarial headache, or neuralgia, and when quinine by the mouth does not seem to benefit, possibly, as he adds, because they don't take it, having lost faith in it. He asks if slow absorption is really a contra-indication in ordinary cases, and if tetanus is a real danger. He has given about 3,000 injections, and is convinced of their value, though he admits that scientific proof regarding their virtues is lacking.

He suggests that the *Indian Medical Gazette* should take up the question, and as a result the Editor invites opinions and offers to publish them.

A. B.

i. McGRIGOR (H. J.). **Intramuscular Injections of Quinine.** [Correspondence]. *Jl. Trop. Med. & Hyg.* 1914. Nov. 2. Vol. 17. No. 21. p. 336.

ii. ROSS (Ronald). **Intramuscular Injection of Quinine.** [Correspondence]. *ibid.* Nov. 16. No. 22. p. 352.

i. The case is cited of a patient in Borneo who had an idiosyncrasy to quinine, suffering from intense headache, vertigo, nausea, and a severe form of urticaria, so that he had not taken any of the drug. The author gave him 10 gr. of bi-hydrochloride of quinine by the mouth with distressing results, and afterwards hypodermics of the same salt three times a day for two days, then once daily for a week. No poisoning took place from these injections. The patient recovered, purchased a syringe and injected himself twice a week as a prophylactic. He had no further attacks.

ii. Ross comments upon this case. He thinks that it merely confirms his view that quinine given intramuscularly is not absorbed, as otherwise the patient would again have shown signs of distress. There is no definite proof of cure for such chronic cases often improve for long periods without any treatment and, in any case, the first dose by the mouth might have destroyed vast numbers of parasites. He again calls for scientific proof, and says that in the meantime he wonders why injections are given, especially as he suspects that many cases supposed to be cured by them really relapse, while he believes that many of the fatal results recorded in pernicious malaria occur simply because the quinine has remained unabsorbed in the tissues.

A. B.

Peter (A. G.). **Note on Limitation of the After-Pain of Quinine Injections.**—*Lancet.* 1914. Oct. 24. p. 994.

The author appears to have been rather unfortunate in his use of intramuscular quinine injections, for his patients have suffered much from after-pain. He mentions one case where tenderness still persisted three months after the last injection had been given, and this though the utmost care had been taken in the way of securing strict surgical cleanliness. [Peter, however, does not say in what form he used the quinine—a notable omission—or in what doses he gave it.] His way out of the difficulty has been to add quinine and urea hydrochloride to the quinine which he usually employs.

[One need not give the details of his method, which exemplifies a curious form of procedure. It is very strange that it has never occurred to him to use the quinine and urea hydrochloride *alone*, as employed by Cohen and others. (See this *Bulletin*, Vol. 4, p. 373.)]

A. B.

Brodbent (C.). **Intravenous Quinine in Malaria.** [Correspondence]. *Indian Med. Gaz.* 1914. Nov. Vol. 49. No. 11. pp. 448.

Brodbent states that both his own experience and the statements of such authorities as Ross, Semple and Rogers, have led him, in cases of severe infection, to discard the use of intramuscular quinine injections in favour of the intravenous method.

He records three such cases in which he gave from 5 to 7 grains of the hydrochloride, or bi-hydrochloride, intravenously, with gratifying results. In one of these cases, complicated by enteric fever, quinine by the mouth and by intramuscular injection failed, although the onset of deafness indicated that it had been absorbed.

As regards a fourth case, where a fatal result followed treatment by the oral and intramuscular administration of quinine, the author states that had the intravenous method been permitted he believes the patient might have been saved.

He says that in severe cases in future he will give three doses of 7 grains at six days' interval, and endeavour to watch the blood of patients thus treated for the next three months.

A. B.

Crespin (J.). **Quinine et Hectine dans le Paludisme.**—*Bull. Gen. de Therap.* 1914. Vol. 167. pp. 463–471.

The author, while agreeing that quinine is of great value in malaria, inveighs against the custom of taking it in a haphazard manner. He is not certain but that the cirrhosis and chronic nephritis met with in old malarics who have undergone intensive quinine treatment over a long period may not be due to the action of the drug. He puts forward a plea for the standardisation of doses, and then points out that quinine acts in two distinct ways, according to the dose given. In large doses it is anti-parasitic, antifebrile, and hinders phagocytosis. In small doses it acts as a tonic, accelerates nutrition and so resembles hectine which, in doses of 0·10 to 0·20 gramme, powerfully stimulates phagocytosis.

He considers the conditions where quinine is likely to fail, *i.e.*, in those febrile attacks which follow indigestion or fatigue, and in which malarial parasites are not found in the blood, and in chronic aestivo-autumnal cases where crescents are present. It is under such circumstances that hectine proves its value.

In certain instances, or after large doses of quinine have been given, it is often advisable to exhibit an anti-haemolytic such as chloride of calcium, cholesterin, or hectine, for a few days, and then to give another strong dose of quinine. The author believes hectine to be the best of these anti-haemolytics because of the manner in which it favourably influences phagocytosis.

He has used hectine in the doses indicated both by injection and by the mouth during a period of four years, and finds that, as Rogues has stated, it increases both the red cells and the haemoglobin content. He is very satisfied with it, and has practically no untoward results to record from its use.

A. B.

Cantlie (James). **A Useful Prescription in Chronic Malaria with Enlarged Spleen.**—*Jl. Trop. Med. & Hyg.* 1914. Nov. 2. Vol. 17. No. 21. pp. 323–324.

In cases of chronic malarial splenomegaly the author advocates the use of quinine, arsenic, opium, and mercury combined according to the following formula :—

℞

Quininae Hydrochlorid ..	gr. v. to gr. vii.
Acid. Arseniosi	gr. 1/36th to gr. 1/24th.
Pulv. Ipecac. Co.	gr. iii to gr. iv.
Hydrarg. Subchlorid ..	gr. 1/10th to gr. 1/6th.

Fiat pulv. in cachets.

Sig. One at 11 a.m. and another at bed-time.

He points out that the ingredients are really those of the old fever powder commonly used in England when malaria was rife. In those days, however, the mercury was given separately in the form of blue pill, and for its purgative action. Cantlie affirms that it owes its value to its germicidal action, and that mercury is not a suitable purgative in cases of tropical liver. He has also something to say about the reason for employing the other ingredients in what is undoubtedly a very useful combination.

A. B.

Yoré (Hillel). **Traitement des Cachexies Paludéennes.**—*Bull. Soc. Path. Exot.* 1914. Nov. Vol. 7. No. 8–9. pp. 678–685.

As the result of a prolonged (25 years) and extensive clinical experience in one of the most malarious districts of Palestine, the author emits the following views as regards the treatment of chronic malaria, the typical symptoms of which he describes :—

1. There is a form which is incurable.
2. Cases occur which can be completely cured.
3. There are cases which can be so greatly benefited that the patients can resume work and lead lives not very far removed from the normal.

4. It is possible greatly to reduce enlarged malarial spleens even after they have persisted for as long as ten years and are very hard.

(Records are given of four cases exemplifying Nos. 3 and 4).

5. The basis of the treatment is the administration of quinine regularly and without interruption by the intramuscular method.

6. Even after all febrile symptoms have disappeared continue the injections for from five to ten days, but in decreasing doses.

7. Supplement the quinine therapy by the use of cacydolate of soda, ergotine and iron, and especially by methylene blue in the form of pills.

8. The ergotine has an undoubted influence in diminishing the splenomegaly.

9. In cases without oedema, but showing profound debility, and especially in children, the injection of artificial serum will be found to have an excellent effect.

10. Change of climate is of great value, but in many cases care must be taken to select the proper time for sending the patient away. He should not leave until he has made considerable progress under the treatment indicated.

The author concludes with some remarks on quinine haemoglobinuria, and on indications and contra-indications to quinine therapy as furnished by blood examinations, but these do not call for special notice. Puncture of the spleen is only justifiable in cases of difficult diagnosis, as when chronic malaria has to be distinguished from kala azar.

[The paper must be consulted for details of the treatment, but unfortunately the author does not state what salt of quinine he employs for the intramuscular injections. The question of splenectomy in very chronic and severe cases is not considered.]

A. B.

MacGilchrist (A. C.). (i) **Cinchona Derivatives Inquiry. First Communication.**—*Indian Jl. Med. Research.* 1914. July. Vol. 2. No. 1. pp. 315–335. With 3 charts and 4 text figs.

(ii) **Second Communication.** *Ibid.* pp. 336–348.

i. MacGilchrist continues his valuable work upon cinchona derivatives, which were obtained from three sources :—(1) The Government quinine factory at Mungpoo, near Darjeeling, (2) Merck & Co., Darmstadt, and (3) Zimmer & Co., Frankfort-on-Maine. In this and in a following paper he only deals with some of these, so that he has still a fruitful field of enquiry before him. He mentions a Darmstadt preparation called quinetum (a mixture of the alkaloids as they occur in the bark of *C. succirubra*, containing quinine, cinchonine, cinchonidine and amorphous bases), quinium (an extract prepared according to a French formula, containing all the constituents of bark with the exception of woody fibre, and said to be better than quinine in rebellious cases of malarial fever), and a species of solid quinoidine from Germany occurring in irregular fragments. Quinoidine is a mixture of the amorphous alkaloids of cinchona bark, and the substance received from the Mungpoo factory is semi-solid, tarry or treacle-like.

In the paper under review the author considers only his investi-

gations into the Mungpoo products, and he first of all gives an account of their botanical sources and methods of manufacture.

He describes how quinine sulphate is obtained, how residual alkaloid is prepared, and the process of separating out the individual alkaloids, *i.e.*, cinchonidine, quinidine, cinchonine and quinoidine.

The object of the author's quest was to determine which derivative would be most useful for testing malaria, *i.e.*, would kill the parasite, and yet cause least inconvenience or harm to the host. For this purpose he employed infusoria, as representing protozoa, and guinea-pigs. He proposes also to make use of cats.

Details regarding technique and the experiments are furnished, and charts give a graphic representation of the relative lethality of neutral solutions of the sulphates of quinine, quinidine, cinchonine, cinchonidine, and quinoidine to *Paramoecium caudatum*, and a species of *Stylonychia*. The author summarises his results, but it is only necessary here to quote his main conclusions which are: "(1) That cinchonidine is the only alkaloid less harmful [than quinine] to guinea-pigs, but on the other hand that its lethality to *infusoria* is much less than that of quinine; (2) that quinidine is more harmful to guinea-pigs and not so lethal to *infusoria*; and (3) that cinchonine is somewhat more lethal to guinea-pigs, but is at the same time much more lethal to *infusoria*. These results certainly suggest that cinchonine should be given a thorough trial."

ii. The hydrochlorides of hydroquinine and ethyl-hydro-cupreine have been tested by the author in respect to lethality, and compared with the hydrochloride of quinine obtained from the Indian Government's quinine factory at Mungpoo. The results are best shown by quoting in full the summary and conclusions:—

"Ethyl-hydro-cupreine and hydroquinine are less lethal than quinine to guinea-pigs; cinchonine is slightly more lethal than quinine. Ethyl-hydro-cupreine is more lethal than any of these towards *Paramoecium caudatum* and other *infusoria;* cinchonine comes next in order of lethality; quinine and hydroquinine are for all practical purposes of equal lethality to these *infusoria.*

"The pharmacological action of ethyl-hydro-cupreine is very similar to that of quinine.

"When exposed for hours or days *continuously* to the action of fairly dilute solutions (1 : 150,000) of these substances, *P. caudatum* is unable to acquire any immunity against these toxic agents or adapt itself to life in such media. This does not preclude the possibility of immunity being acquired if the solutions were still *more dilute* or if the exposure were *intermittent.*

"The results obtained suggest a possibility of the superiority of ethyl-hydro-cupreine and cinchonine over quinine in the treatment and prophylaxis of malaria. The former *may be* difficult to prepare and expensive; the latter is easily obtainable and cheaper than quinine. The former has not yet been tried in *malaria; the latter has, and there is evidence, clinical and experimental, that cinchonine is superior to quinine as an anti-malarial agent. Moreover, as cinchonine is sometimes fraudulently substituted for quinine and no ill-effects have apparently followed this use of cinchonine, any slightly greater toxicity to mammals which this alkaloid may possess is a negligible factor.

* Since this was written Izar and Nicosia (Catania) have reported success with this substance in cases of malaria refractory to quinine.

"Quinine (methyl-cupreine), hydro-quinine (methyl-hydro-cupreine) cupreine, and ethyl-hydro-cupreine are all closely related and appear to have a similar pharmacological action; in contradistinction to cinchonine these substances display more of a paralysing than stimulating action on the convulsive centres of the brain."

The author states that Zimmer & Co. of Frankfort-on-Maine have succeeded in preparing hydroquinine (methyl-hydro-cupreine) synthetically from quinine. It is probable that from this the ethyl-hydro-cupreine or "Optochin" is prepared.

Cinchonine salts are the cheapest of the cinchona alkaloid salts, and both cinchonine and hydroquinine occur in cinchona barks. The bark of *Cinchona micrantha* is specially rich in cinchonine.

Cupreine is an alkaloid occurring along with quinine in the bark of a false cinchona, and it is said that it has been artificially converted into quinine. For further details this useful paper should be consulted in the original. A. B.

Hehir (P.). **Prevention of Malaria in the Troops of our Indian Empire.** *Indian Med. Gaz.* 1914. Aug. Vol. 49. No. 8. pp. 305–309.

Throughout our Indian Empire malaria is the chief cause of inefficiency both amongst European and Indian troops. As a rule infection takes place in the cantonment, and it is with this aspect of the question that Hehir's paper chiefly deals. He indicates how a mosquito survey of a cantonment should be carried out, and how valuable evidence as to malarial prevalence is to be obtained from a spleen census amongst the children of a cantonment. The spleen rate in troops is not reliable. Notes upon anti-mosquito measures follow, and the author testifies to the excellent results which they have yielded at Agra, Mhow, Belgaum, Hyderabad (Sind), Quetta, Bangalore, Cawnpore, River Forts (Rangoon), Mandalay and Lucknow. Failure, in his opinion, is due to patchwork and change of policy. Soldiers should be trained to destroy the imagines in barrack rooms. The punkah coolie may serve as a fertile source of infection.

A wise measure is to keep European troops at non-malarial hill stations until the malarial season is past, and it is imperative carefully to treat all carrier cases.

Quinine should not be given in cases of doubtful pyrexia, where the malarial parasite has never been demonstrated in the blood. The author discusses the question of prophylaxis at some length. His remarks, though very sound, contain nothing new and need not be quoted, but a note as to his own practice may be permitted. He states: "One's personal experience is that the best prophylactic dose of quinine during the malarial season where malaria is comparatively mild is 5 grains daily, where it is severe 5 grains daily for six days and 10 grains on the seventh day weekly, and where it is very severe 5 grains for six days and 15 grains on the seventh day weekly."

He concludes with a plea for the enforcement of *all* preventive measures, and points out that the procedure adopted must be determined by local circumstances. A. B.

Macdonald (W. R.). **A Short Note on the Use of Larvicidal Fish in Combating Malaria Fever.**—*Proc. Third All-India Sanitary Conference held at Lucknow, Jan. 19–27.* 1914. Vol. 4. Papers. Suppl. *to Indian Jl. Med. Research.* pp. 75–77.

The larvivorous fish of Madras City are mentioned. There are three

species of *Haplochilus*, the well-known *Chela*, *Rasbora daniconius*, the common minnow, and *Therapon jarbua*. The author comments on the necessity of clearing away algae, weeds and vegetation growing in the water collections, so that the fish may have free access to mosquito larvae.

In one instance it was found that oiling operations could be carried out without risk to the fish life. Explanatory details are lacking.

A. B.

Rho (F.). **Difficoltà e Successi della Profilassi Chininica massime nei Paesi Tropicali.** [Difficulties and Successes in Quinine Prophylaxis, especially in Tropical Countries.]—*Ann. Med. Navale e Coloniale.* 1914. July. Ann. 20. Vol. 2. No. 1. pp. 53–62.

A general discussion of the subject of quinine prophylaxis, chiefly worth looking at for the tables supplied. Some of these show an arrest in the fall of malaria incidence in recent years, indicating that there is a limit to the benefit which can be obtained by the unassisted method of reliance upon quinine.

J. B. Nias.

i. Bressanin (R.). **La Profilassi Antimalarica nel Dipartimento Militare Marittimo di Venezia nell' Anno 1913 (aggiuntivi i dati per il 1912).**—*Ann. Med. Navale e Coloniale.* 1914. July. Ann. 20. Vol. 2. No. 1. pp. 43–45.

ii. Tacchetti (G.). **La Proffilassi Antimalarica del Dipartimento e Piazza Marittima di Taranto durante l'Anno 1913 (aggiuntivi i dati pel 1912).**—*Ibid.* pp. 46–52.

Two statistical reports of the usual type dealing with the results of quinine prophylaxis amongst the Italian naval and military forces of the districts named, presenting nothing of special interest to foreign readers, with the exception that, in the second one, Surgeon-Colonel Tacchetti expresses the opinion that an attack rate of 1 per cent. for new cases exposed to infection is about the lowest that can be expected under a system of unaided quinine prophylaxis. To secure any further reduction, measures specially directed to mosquito extermination must be resorted to.

J. B. N.

i. Timpano (Pietro). **La Lotta Antimalarica a Condofuri Marina (Reggio Calabria) nel 1912 e 1913. Nota Epidemiologiche e Cliniche.** [The Antimalarial Campaign at Condofuri Marina in 1912 and 1913.]—*Propaganda Antimalarica.* 1914. Oct. 31. Vol. 7. No. 5. pp. 132–138.

ii. Orta (Francesco). **Propaganda Antimalarica Scolastica nella Provincia di Ferrara, Anni Scolastici 1912-13, 1913-14.** [Antimalarial School Instruction in the Province of Ferrara for the Years 1912 and 1913]. *Ibid.* pp. 138–141.

Two short reports on the subjects for which this periodical was founded, of merely local interest. [The greater part of the present number is occupied by sympathetic notices of the life and work of the late Professor Angelo Celli, to whom the initiation of the antimalarial campaign in Italy is chiefly due. Professor Celli's last report on the subject was recently summarised for this *Bulletin*.]

J. B. N.

Balfour (Andrew) & Wenyon (C. M.). **The So-Called** *Plasmodium tenue* (Stephens).—*Jl. Trop. Med. & Hyg.* 1914. Dec. 1. Vol. 17. No. 23. pp. 353–354. With 2 coloured plates.

The paper which called forth this communication was published in April in the *Proceedings of the Royal Society*, and noticed in this *Bulletin*, Vol. 3, p. 432*. The authors point out that Stephens's diagnosis of a new species was based on the morphological peculiarities of a malarial parasite which he found in a single blood film from a native child in India, which was sent to him. They write :—

"Had Dr. Stephens been able to study his case clinically from day to day and show that the parasite he describes always assumed the amoeboid form at that particular stage in its development, despite varying technique ; that in its further growth and multiplication by schizogony it departed from the type usually associated with the parasite of sub-tertian malaria ; that the gametocytes presented some peculiar features ; then there might have been some ground for thinking that the parasite was a distinct species. Even then it would be doubtful if sufficient justification existed for the creation of a new species on a single case."

Stephens believes that *Plasmodium tenue* differs from *P. falciparum* in (1) its amoeboid activity, (2) the abundance and irregularity of its nuclear matter.

The authors point out that a plate published in the Third Report of the Wellcome Tropical Research Laboratories (1908), reproduced by them, represents a form of malarial parasite very closely resembling, if not identical with, the so-called *Plasmodium tenue*. In this case a few crescents were found and there was nothing in the clinical history to distinguish the case from one of ordinary tropical malaria. It is generally recognised that, besides the well-known rings, amoeboid forms of the sub-tertian parasite are occasionally found, more especially in the late stages of those cases which have very large infections and often terminate fatally. What determines their presence cannot be stated. It is noted that the degree of amoeboid activity of the benign tertian, as well as the quartan, parasite varies considerably from one case to another. Explanations are suggested. "It is only by a careful study of films made on many occasions and under varying conditions of technique that we can hope to establish the true nature of such an organism and eliminate abnormal or unusual appearances from the customary cycle of development."

Two other cases which one of the authors has come across are of interest in this connection. One was from West Africa and represented by a single film. This, which is reproduced, shows amoeboid forms in large numbers, as well as ring forms and crescents. A second case was that of an Arab seen at Bagdad, who had an enormous malarial infection. Several films were made, an hour and just before his death. Ordinary rings of the sub-tertian variety were very numerous, and there were also present irregular amoeboid forms like those figured by Stephens, which evidently represented the youngest stages of parasites, since in them the pigment appeared to be absent. There was plenty of pigment, however, in the crescents and schizonts. There was much chromatin in the nucleus. Many of the infected corpuscles showed Maurer's dots. An excellent plate illustrates the parasites.

A. G. B.

*The name of the parasite was there wrongly given as *Plasmodium pertenue*.

Elfer (A.) & von Purjesz (B.). **Beiträge zur Ausscheidung des Kaliums bei einer Malaria Erkrankung.** [Contribution to the Question of the Excretion of Potassium in a Case of Malaria.]—*Biochem. Zeitschr.* 1914. Vol. 64. pp. 63–71.

The authors point out that despite many observations little is known about the behaviour of potassium in the human body under normal and pathological conditions. The subject is a difficult one, and its study requires great dexterity in chemical technique.

It is generally known that in febrile diseases the excretion of mineral substances may vary considerably. All are agreed that during the febrile access in malaria, contrary to what occurs in other fevers, the excretion of chlorides is not diminished. Accurate knowledge, however, is lacking as regards the behaviour of potassium in malaria, though Salkowski long ago made some observations regarding it in pneumonia, recurrent fever, erysipelas and enteric fever.

The authors, in an endeavour to fill up the gap, carried out observations during a period of eight days upon a case of tertian fever in a young man aged 23. The patient was untreated for two days, was then for a period of four days given daily doses of 1½ grams of sulphate of quinine, and again remained untreated for two days. His dietary during this period is stated, and the chemical analyses performed are shown in the form of tables.

The authors admit that too much stress must not be laid upon their results, and hence it is only necessary to say that they found that next to a high nitrogen loss, specially observable during the febrile period, the greatest disturbance was in the utilisation of the potassium. Their results clearly show also that the decrease of potassium in the urine and faeces persists after the decrease in sodium and chlorine is no longer evident. In this respect the change in the potassium corresponds to what happens to the nitrogenous material, but quantitatively the potassium is low when the nitrogen is high, and *vice-versa*. [The tables should be consulted for details.]

The authors are careful to insist on the fact that the case they examined was both a severe one and was also a fresh infection. [Presumably they mean a primary infection. No record of the blood findings is given.] A. B.

PELLAGRA.

GOLDBERGER (Jos.). **The Cause and Prevention of Pellagra.**—*U.S. Public Health Rep.* 1914. Sept. 11. Vol. 29. No. 37. pp. 2354–2357.

The medical officer in charge of the U.S. Government's pellagra investigations points out the extraordinary immunity enjoyed by attendants in the asylums, where many lunatics contract the disease. Also that in an orphanage of 211 inmates practically all the cases of pellagra were between the ages of 6 and 12 years. The exemption of younger and older children, like the well known immunity of asylum employees, can only be explained by some difference in the diet.

Pertinently he remarks that "no pellagra develops in those who consume a mixed, well balanced and varied diet, such, for example, as the Navy ration, the Army garrison ration or the ration prescribed for the Philippine scouts.

"The inference may therefore be safely drawn that pellagra is not an infection, but that it is a disease essentially of dietary origin; that is, that it is caused in some way such as, for example, by the absence from the diet of essential vitamines, or possibly, as is suggested by MEYER and VOEGTLIN'S work, by the presence in the vegetable-food component of excessive amounts of a poison such as soluble aluminum salts. . . . .

"It has repeatedly been noticed by observers that at insane asylums the 'untidy' (the group in which my observations show scurvy and beriberi most likely develop) were the most afflicted with pellagra."

[It is not enough to say that the diet of an institution is perfect. The question is, did the pellagrin in that institution regularly eat that diet?]

F. M. Sandwith.

SILER (J. F.), GARRISON (P. E.) & MACNEAL (W. J.). (i) **Introduction to the Second Progress Report of the Thompson-McFadden Pellagra Commission.**—*Archives of Internal Med.* 1914. Sept. Vol. 14. No. 3. pp. 289–292.

(ii) **Further Studies of the Thompson-McFadden Pellagra Commission. A Summary of the Second Progress Report,**—*Jl. Amer. Med. Assoc.* 1914. Sept. 26. Vol. 63. No. 13. pp. 1090–1093.

(iii) **A Statistical Study of the Relation of Pellagra to Use of Certain Foods and to Location of Domicile in Six Selected Industrial Communities.**—*Archives of Internal Med.* 1914. Sept. Vol. 14. No. 3. pp. 293–373. With 29 figs.

These three papers are the first fruits of another year's careful work in Spartanburg County, South Carolina, where 847 pellagra cases were traced, together with all data concerning their homes, occupation, lives and diet. Fourteen patients were transferred to the Post-Graduate Hospital in New York for observation and treatment. Doubtless full records will be published later; all we are told now is that all the 14 returned home free from active manifestations of pellagra. Two died during the following winter from other causes, and one could not be traced; of the remaining 11, eight relapsed at home and three were free from recurrence during 1913.

[We are not yet told whether upon their return home they reverted to their former conditions of food and life.] The Commission has continued the work of 1912, so that the observations of that year have been supplemented and extended. We regret to read that "the metabolism studies of 1912 had yielded definite negative information and seemed to be sufficiently complete and were therefore discontinued." No evidence was obtained to incriminate maize-meal in the county and restriction of the use of it has not proved effective as a prophylactic against pellagra. Six mill villages, inhabited by 861 families, of which 140 contained one or more pellagrins, were investigated to see whether the consumption of fresh meat had any etiological bearing on the disease. In three of these villages there was no one who was in the habit of eating meat every day, while in the other three villages the daily meat-eaters numbered 29, 2 and 51. This rarity of fresh meat consumption looks at first sight like evidence in favour of deficient nutrition, but this is not borne out by the figures. The 82 who ate fresh meat every day provided four pellagrins or 4·88 per cent., while 263 persons who never ate meat at all were found to have 1·52 per cent. of pellagrins. On the other hand the villagers who drank milk every day were the least likely to contract pellagra, for only 43 out of 3,130 acquired it during the two years, *i.e.*, 1·37 per cent. Of those who never drank milk 5·43 per cent. became pellagrous. Though disagreeing with the theory that pellagra is the direct result of a general deficiency in diet, "the theory that a deficiency in some special dietary constituent may cause pellagra seems worthy of much more attention."

It is to be noted that most of the families under study possessed small gardens and fresh vegetables were everywhere used in season.

The following conclusions are reached :—

"1. The large active foci of pellagra in Spartanburg County were found in and near the large centres of population, and particularly in the cotton-mill villages.

"2. Children under the age of 2, adolescents for about five years following puberty and adult males in the active period of life were least frequently affected by pellagra. On the other hand, women from 20 to 44 years of age, old persons of both sexes and children from 2 to 10 years of age were most frequently affected.

"3. No definite connection between occupation and the occurrence of pellagra has been found, although the high pellagra morbidity in the women and children points to the home as the place in which the disease is usually contracted.

"4. In the group of incident cases most thoroughly studied, evidence of close association with a pre-existing case was disclosed in more than 80 per cent.

"5. A house-to-house canvass of the homes of over 5,000 people living in six endemic foci of pellagra failed to disclose any definite relation of the disease to any element of the dietary.

"6. In these six villages new cases of pellagra originated almost exclusively in a house in which a pre-existing pellagrin was living, or next door to such a house, suggesting that the disease has spread from old cases as centres.

"7. So far as we have observed, pellagra has spread most rapidly in districts where insanitary methods of sewage disposal have been in use.

"8. Additional evidence has been obtained to support the conclusion that flies of the genus *Simulium* have nothing to do with pellagra.

"9. Animal inoculations and the experimental study of intestinal bacteria have not yielded conclusive results.

"10. The studies of the blood have shown a lymphocytosis in most cases, but have not disclosed any constant abnormality characteristic of pellagra.

"11. There is no evidence of inheritance of pellagra.

"12. The immediate results of hygienic and dietetic treatment in adults have been good, but after returning to former conditions of environment, most of the cases have recurred. In children, progonosis is very much more favourable."

F. M. S.

Siler (J. F.), Garrison (P. E.) & MacNeal (W. J.). **The Relation of Methods of Disposal of Sewage to the Spread of Pellagra.**—*Archives of Internal Med.* 1914. Oct. Vol. 14. No. 4. pp. 453–474. With 9 figs.

This paper is a part of the Second Progress Report of the Thompson-McFadden Pellagra Commission and details work undertaken because the authors were impressed with the possibility that insanitary disposal of sewage might be an important factor in the spread of pellagra. The methods of disposal of excreta were accordingly investigated with regard to most of the pellagrins in Spartanburg County. They recall the outbreak at the Peoria lunatic asylum, in spite of "a most excellent water-carriage system of disposal of sewage," where the pellagrins were two and a half times more frequent in the "untidy" wards than in wards housing patients with cleanly habits. The rapid disappearance of pellagra from this asylum occurred after all pellagrins in it were isolated.

The conclusions are as follows :—

"1. Pellagra morbidity was higher in congested communities using surface privies than in more sparsely settled districts in which similar methods for the disposal of excreta were employed.

"2. In the city of Spartanburg the endemic foci of pellagra were located in the districts in which surface privies were in use.

"3. In cotton-mill villages equipped with surface privies pellagra was found to be endemic and new cases of the disease arose there year after year.

"4. In two cotton-mill villages completely equipped with water-carriage systems of sewage disposal it was impossible to find cases of pellagra which had certainly originated there, although some cases which had originated elsewhere were present.

"5. There is some evidence that pellagra spreads in hospitals for the insane more readily in the wards housing untidy patients.

"6. This study indicates that methods of disposal of human wastes may prove to be a determining factor in the spread of pellagra in certain communities and it suggests a possible method of prophylaxis, which is now being tested in a practical way."

F. M. S.

Lorenz (W. F.). **The Cerebrospinal Fluid in Pellagra.**—*U.S. Public Health Rep.* 1914. Sept. 11. Vol. 29. No. 37. pp. 2360–2363.

The author examined 153 times, by lumbar puncture, 106 cases of pellagra in the Georgia State Sanitarium. The series included all types, mostly very acute cases with severe mental and physical manifestations, and on some of these a second puncture was made after the acute condition had subsided. The series also included cases which showed very little or no mental disturbance. The routine examination consisted of a cell count, an estimation of the globulin

and Wassermann's and Lange's tests. Eight cases gave a lymphocytosis ranging from 20 to 60 cells per cmm., and were all positive to Wassermann with both spinal fluid and blood serum; they were therefore held to be pellagrins with syphilis as complication. The only other cases which were positive to Wassermann were two dying pellagrins in whom no history or other evidence of syphilis could be obtained.

"The absence of any evidence in the form of a lymphocytosis or an increase of any of the nucleated elements of the spinal fluid points to the absence of an infection with inflammatory lesions in close proximity to the circulating (cerebrospinal) fluid."

"Summarizing the results of this investigation, the following conclusions are offered :—

"1. A lymphocytosis of the cerebrospinal fluid does not occur in uncomplicated pellagra.

"2. Globulin excess of the spinal fluid is only occasionally observed.

"3. Lange's colloidal gold chloride test is uniformly negative in pellagra.

"4. The Wassermann is negative with a few exceptions. In this investigation the exceptions were moribund cases which gave weakly positive reactions with blood serum.

"5. The spinal-fluid findings would seem inconsistent with a conception that pellagra is an infectious disease of the central nervous system."

F. M. S.

Rossi (O.). **On the Aetiology of Pellagra and its Relation to Psychiatry.**—*Amer. Jl. of Insanity.* 1912–1913. Vol. 69. No. 5. (Special No.) pp. 939–964.

The author begins and ends this address, delivered to the Psychiatric Clinic of the Johns Hopkins Hospital, by confessing that the problem of etiology is still unsolved and that alienists know very little about the mental changes in pellagra. He reminds us of the principal objections to the various maize theories and also disbelieves in the views which blame schizomycetes, hyphomycetes and protozoa. He recognizes the great importance of collateral causes such as poor economic and hygienic conditions, and claims support from the two facts that pellagra in Italy is on the decrease and that it disappeared from the province Les Landes soon after the soil had been made fertile and the general prosperity of the inhabitants had been raised. He holds "that the pathological anatomy of pellagra in general and especially the changes in the central nervous system have more the stamp of an intoxication than of an infectious process." He states that the Government Pellagra Commission in Italy could not find any connection between simulia and pellagra, nor could it find any cases of the disease among infants, nor among the superintendents of labourers, who are often bitten by simulia while working with the peasants in the fields.

F. M. S.

Alessandrini (Giulio) & Scala (Alberto). **Contributo Nuovo alla Etiologia e Patogenesi della Pellagra. Memoria.**—*Annali d'Igiene Sperimentale.* 1914. Vol. 24. (New Series.) No. 1. pp. 1–175. With 18 plates and 30 figs. and Reprint. Roma: Tipografia Nazionale di G. Bertero E. C.

Professor Alessandrini, since 1909, has made up his mind that (1) pellagra is not entirely dependent upon a maize diet, and (2) it is a strictly localized disease and limited to those areas where water si drunk which has been almost exclusively in contact with a clay soil.

He then supposed on scanty evidence that pellagra was caused by a parasite of the filarial family. Now he has enthusiastically embraced the view of Professor Scala that silicic acid in a colloidal state in drinking water can produce a chronic intoxication which is something like pellagra. In Rome, 94 experiments were conducted on guinea-pigs, rabbits, dogs, and even on some monkeys, and consisted chiefly in the administration of silica in colloidal solution and in a gelatinous state by mouth, and by subcutaneous and intraperitoneal injections. The effect on the animals was a series of symptoms and a few pathological lesions which the authors maintain are similar to those observed in pellagra. [In the tabulated symptoms no importance is drawn between the typical classical signs and those rarer ones which sometimes accompany a case. The authors' work has already been reviewed in this *Bulletin*. See Vol. 2, p. 487.]

They found that silica acts on animals indirectly rather than directly, and that its effects could be neutralized by intramuscular or sub cutaneous injections of neutral citrate of sodium. They therefore suggest that human pellagra should be treated by tri-sodic citrate (10 per cent. solution hypodermically) in daily doses of 1 cc., the chlorine elimination being checked by regular examination of the urine. Details are given of ten cases so treated, and all of them gained slightly in weight. Photographs of the face and hands of the tenth insane woman are published to show how the eruption disappeared after 24 daily injections in May and June. [For generations it has been suspected that a deficiency of salt may be one of the factors predisposing towards pellagra.] F. M. S.

Hunter (S. J.). **The Sandfly and Pellagra. 3.**—*Jl. Economic Entomology.* 1914. June. Vol. 7. No. 3. pp. 293–294.

The Board of Education in Kansas is trying to obtain evidence which will confirm or refute the Sambon theory, and the author is responsible for the entomological side of the question. In August, 1913, the *Simulium vitattum* was studied in Southern Montana. It was noted that the bite of the fly could not always be felt by the victim. A monkey which was several times inoculated from the sandfly, the latest date being December 22nd 1912, began in November 1913, "to show a marked stomatitis accompanied by a diarrhœa. She has continued to lose in weight and the colour of the face is changing from the normal to a pale ashy gray. This is simply a report of progress, and as the author views it, does not warrant any conclusion for or against the Sambon theory." F. M. S.

i. Balp (Stefano). **Le Scuole d'Igiene e di Educazione Domestica nella Lotta contro la Pellagra.** [Schools of Hygiene and Domestic Instruction in the Contest against Pellagra.]—*Rivista Pellagrologica Italiana.* 1914. Mar. Vol. 14. No. 2. pp. 18–22.

ii. Franchetti (Augusto). **Ricerche intorno alla Pellagra nei Bambini** [Researches on Pellagra in Children.]—*Ibid.* pp. 22–27.

iii. Antonini (G.). **Il piu grande Studioso della Pellagra.** [The Greatest Student of Pellagra.]—*Ibid.* pp. 29–30.

i. A series of general remarks on the subject indicated by the title of the paper.

ii. The report of a statistical enquiry set on foot by the Pellagra Commission to test SAMBON's theory that pellagra, if due to the bites of insects, ought to be an extremely common malady amongst children. For this purpose about 9,000 infants, up to 18 months of age, were examined in various pellagrous districts of the province of Venezia, about 2,000 in that of Verona, and so on throughout 34 of the Italian provinces, with the result that nothing was found to support SAMBON's contention.

iii. A sarcastic article ridiculing the application of the above title to Dr. SAMBON by a writer in the *Tribuna* of Rome.

J. B. N.

PAGE (Boney Wells). **Is Pellagra due to an Intestinal Parasite?**—*Amer. Jl. Public Health.* 1914. Oct. Vol. 4. No. 10. p. 933.

The author is described as "whole-time County Health Officer of Robeson County" in North Carolina. In the faeces of 17 pellagrins he has found an animal parasite, which appears in three different forms: an oval form resembling an amoeba, which often changes its shape into a bacillus, while "either of these forms may change into the third form, that of a spirilla" [*sic*]. "The parasite may be found in faeces several days old."

[Possibly the last quotation supplies the answer to the author's question.]

F. M. S.

TIZZONI (Guido). **La Pellagra in Bessarabia.**—*Rivista Pellagrologica Italiana.* 1914. Nov. Vol. 14. No. 6. pp. 81–82.

The author announces that from a further series of 12 cases of pellagra examined by him in Bessarabia he has been able to isolate the pleomorphous bacillus already described by him. [See this *Bulletin*, Vol. 4, p. 284.]

J. B. N.

LOWERY (J. R.). **Pellagra.**—*Med. Record.* 1914. Aug. 29. Vol. 86. No. 9. (Whole No. 2286). pp. 378–379.

The author, after five years' experience of pellagra in North Carolina, is convinced that the disease is due to the absorption of poisons from the intestines. He also believes that pellagra is now met with because modern bread is made from flour from the roller mill and does not contain the bran, which is necessary as a stimulus to intestinal action. Three quarters of his cases have been in women who had borne a child within one year before the first symptoms occurred. He does not say how many cases he has treated, but 24 per cent. of them died. For treatment he believes most in a change of diet, aided by large doses of arsenic.

F. M. S.

LAVINDER (C. H.), FRANCIS (Edward), GRIMM (R. M.) & LORENZ (W. F.). **Attempts to transmit Pellagra to Monkeys.**—*Jl. Amer. Med. Assoc.* 1914. Sept. 26. Vol. 63. No. 13. pp. 1093–1094.

Since 1910 many unsuccessful attempts to inject monkeys have

been made, with only one positive result. Dr. HARRIS claims to have produced pellagra in a monkey by the inoculation of a Berkefeld filtrate derived from human lesions. The present authors thought that the problem should again be attacked and as exhaustively as possible. This is a preliminary report upon work begun in August, 1913, at a Government laboratory in Savannah, on 77 Rhesus monkeys, two Java monkeys, and three female baboons. Already 103 times material collected from pellagrins during life or after death has been introduced into the stomachs of animals, 52 times pellagrous fluids have been injected and 96 experiments have been made by injecting extracts, suspensions, or emulsions of pellagrous tissue. Eight animals have died, none with pellagrous symptoms. The survivors, excepting one, have shown no signs of pellagra. This monkey was injected intraspinally with 6 cc. of spinal fluid on April 14th, 1914, and again on May 2nd intraspinally with 4 cc. of spinal fluid drawn from another pellagrin. On May 4th, it was noticed that the right forearm was slightly swollen and the following day similar signs appeared in the left forearm. Both forearms then became entirely denuded of hair, "the skin became roughened and scaly with large cracks in which appeared a slight serous exudate." The bowel movements were occasionally loose. When the authors wrote they reported "the monkey is now again in his usual condition." They decline at present to express any opinion as to whether this one case adds any evidence towards communicability of the disease. Cerebrospinal fluid collected during life from 19 pellagrins, and not Berkefeld filtered, was injected intraspinally into 19 monkeys, of which one is evidently the animal reported upon. [The details which are given show that the experiments are being conducted very thoroughly and it is to be hoped that they will be continued until a result can be proclaimed.] F. M. S.

VOLPINO (G.). **Sul Valore Diagnostico della Pellagrogenina.** [The Diagnostic Value of Pellagrogenin.]—*Rivista Pellagrologica Italiana.* 1914. May. Vol. 14. No. 3. pp. 33–34.

The author applies the term "Pellagrogenin" to an aqueous extract of maize prepared by maceration for several hours at a temperature of 55–60° C., and then concentrated and precipitated with alcohol. The dry powder thus obtained is dissolved for use in water in the proportion of 1 : 100, and after sterilization at 115° C. is injected into the gluteal muscles in doses of 1 cc. of the solution. A reaction follows in the subjects of pellagra, which the author regards as diagnostic of the disease. J. B. N.

VOLPINO (G.). (i) **Sulla Presenza di Sostanze Protettrici nella Cariosside di Grano-Turco e sulla Reazione di Ipersensibilità dei Pellagrosi.** [On the Presence of Protective Substances in the Epidermis of Maize, and on the Hypersensibility Reaction in Sufferers from Pellagra.]—*Pathologica.* 1914. Mar. 15. Vol. 6. No. 129. pp. 147–148.

(ii) **Ancora sulla Ipersensibilità dei Pellagrosi verso gli Estratti Maidici.** [Further Remarks on the Hypersensitiveness of Sufferers from Pellagra to Extracts of Maize.]—*Ibid.* June 1. No. 134. pp. 300–302.

Two brief communications in answer to the criticisms of CESA-

Bianchi (see this *Bulletin*, Vol. 4, p. 283) on the author's previous work on this subject. The author believes that the difference between Cesa-Bianchi's results and his own is due to the difference in the temperatures employed in making the extracts. His own infusions were made at a temperature of 55–60° C. J. B. N.

Volpino (G.). **Il Monofagismo ed i soui Rapporti con le Malattie Popolari della Pellagra, dello Scorbuto e del Beri-beri.**—*Rivista Pellagrologica Italiana* 1914. Mar. Vol. 14. No. 2. pp. 17–18.

Il Monofagismo ed i suoi Rapporti con la Pellagra.—*Gazz. Intern. Med. Chir. Igiene.* 1914. Apr. 4. No. 14. pp. 313–318.

The professor draws attention to the writings of Funk on beri-beri and vitamines and to those of Holst and Froelich on scurvy, and he seems now to be converted to the idea that pellagra is a disease caused by a one-sided dietary. He even groups these three complaints in the following order: pellagra, beri-beri, scurvy. Of laboratory animals he says guinea-pigs are the most sensitive to a one-sided diet, such as wheat, maize, rice, potatoes, cabbage, peas or beans. Each group fed on one of these articles plus water died, and the earliest to succumb were those fed only on cabbage, or peas or potatoes. Before death he found the guinea-pigs all suffered from loss of weight and loss of appetite. He insists again upon the importance of the reaction of hypersensibility in the diagnosis of pellagra, and because he finds that an aqueous extract of healthy maize obtained at 55°–60° C. produces no reaction on pellagrins when injected subcutaneously, whereas a similar extract made at 30° C. gives a strong reaction, he argues that there is a vitamine in the former which does not exist in the latter. Among other experiments he fed 20 guinea-pigs on grass and maize for 40 days and then fed them on maize only; 20 others were fed on ordinary diet [not described] without maize and were then changed to an exclusive maize diet; the first group resisted the exclusive diet for an average of 30 days longer than the second group.

F. M. S.

Carbone (Dominico) & Cazzamalli (Ferdinando). **Studi sulla Eziologia della Pellagra. Nota Seconda.**—*Giorn. d. R. Soc. Italiana d'Igiene.* 1914. Jan. 31. Vol. 36. No. 1. pp. 4–14; Feb. 28. No. 2. pp. 51–63; Mar. 31. No. 3. pp. 99–109; Apr. 30. No. 4. pp. 151–157; May 31. No. 5. pp. 213–222. With 6 figs.

An exhaustive series of experiments, undertaken with the object of producing symptoms of pellagra in rats by feeding them upon maize, which was first sterilized by washing with water and alcohol, and then infected with different moulds (*Mucor*, *Trichoderma*). The results do not seem to have been very conclusive, as most of the symptoms produced can be evoked in rats by feeding them with several other deleterious substances, as the authors admit. The paper, being very long and principally composed of tables, does not lend itself easily to condensation, and should therefore be consulted at first hand by those interested in its subject.

J. B. N.

Frazer (T.). **Mental and Nervous Manifestations of Pellagra.**—*Med. Record.* 1914. July 11. Vol. 86. No. 2. pp. 65–67.

The author now finds, from a large experience in North Carolina, that it is sometimes possible to diagnose early pellagra from the patients' sensory symptoms without waiting for symmetrical dermatitis. His country patients complain of pain or aching in the back, legs or feet, some say their "joints tingle." Their heels or elbows feel "as if in hot ashes." Headache, giddiness and "throbbing in the ears" are also met with, while others complain of stiffness, weakness of legs and tremors, so that one stated: "As soon as I do anything I get all in a quiver." Sleeplessness, loss of interest, lack of self-control, and irritability precede mental depression, and are followed by a general air of apathy, expressionless features and "the lifeless monotone of the voice." He does not find that increased knee jerks are a reliable help for diagnosis.

F. M. S.

Macdonald (J. B.). **Pellagra and its Symptoms: the Importance of Mouth and Gastro-intestinal Lesions.**—*Boston Med & Surg. Jl.* 1914. Sept. 24. Vol. 171. No. 13. pp. 485–489. With 7 text figs.

This is a good account of pellagra, read before the members of a Dental Society, and stress is laid upon the importance of detecting changes in the delicate mucous membrane of the mouth as readily as those in the skin. "The disorders of sensation are usually first noticed, and are more severe in the mouth and stomach." Since April 1913, six pellagrins have been seen in the Danvers State Hospital, to which the author is attached, and none of them were diagnosed before admission. The burning feeling in the mouth and stomach were often referred by the patients to something about the teeth; one formed the idea that a tooth filling had lodged in her throat and insisted upon an X-ray examination. "Another believed that the material used in filling her teeth had poisoned her mouth and given rise to all her discomforts."

F. M. S.

Brengle (Deane R.). **Pellagra in Minnesota.**—*Jl. Amer. Med. Assoc.* 1914. Oct. 3. Vol. 63. No. 14. pp. 1157–1159. With 1 text fig.

This is an account of a Cuban pellagrin, who had resided in different parts of the United States for 31 years. He volunteered that, while in railroad camps, he had eaten quantities of bread made from maize "and that the meal often became mouldy from being kept in the damp store-car." The symptoms were typical, with the addition of enlargement of the epi-trochlear glands; there was no appearance of syphilis and two Wassermann tests were negative. Great improvement, physically and mentally, took place during seven weeks in hospital, where he was treated with rest, nourishing diet and Fowler's solution. The author says that only four cases have previously been reported in Minnesota, but he believes that many undiagnosed cases may exist.

F. M. S.

MILLER (Henry W.). **Report of a Case of Pellagra in Maine with Remarks upon Recent Work on the Etiology of the Disease.**—*Amer. Jl. of Insanity.* 1913. Jan. Vol. 69. No. 3. pp. 551–557.

This seems to be a case of pellagra, which is reported chiefly because the disease is very rare in the New England States. The reporter shows that maize hardly entered into the patient's diet, but he does not seem to have investigated the diet at all carefully. For instance, "the family were in comfortable circumstances," yet the patient, who when not living at home was a waitress, only had meat once a week and fish two or three times a week.

The patient starved herself and had mental symptoms two years before she developed any skin lesions. Quotations are given from a few of the many authors who write on the etiology of pellagra.

F. M. S.

HUNTER (George G.) & WILLIAMS (Edward Huntingdon). **The Widening Pellagra Zone.**—*Med. Record.* 1914. Oct. 31. Vol. 86. No. 18. (Whole No. 2295). pp. 757–759.

Writing from Los Angeles, California, the authors point out that well-marked pellagra is not only increasing its territory, but invading classes in the United States which have hitherto remained practically immune.

Unfortunately the two "typical" cases which they report were complicated by other diseases, and are not convincing. Two years ago a woman began to suffer from severe pain in her muscles and joints, which crippled her when she was in a state of nervous prostration, due to nursing a sick child by day and night. She then developed delusions and hallucinations, followed shortly before death by diarrhoea, aphthous sores of mouth, inflammation, and swelled about the vulva. Two weeks after the onset of diarrhoea, she developed a symmetrical pigmentation, like sunburn, over the knuckles of both hands, the nose, chin and cheeks. The muscles, especially of the legs, were exquisitively painful, so that opium was required; the pupils were small and re-acted very slowly to light; the knee jerks were absent. [There was apparently no autopsy.] The second case, an unmarried woman teacher, had always been considered "queer" and had suffered from a nervous breakdown and recurring mental depression. Her symptoms during the last two years began with severe pain in the muscles of the back, insomnia, and threatened suicide. A year after the onset of this illness, she had marked pigmentation, like a very severe sunburn, over the forehead, cheeks, nose, knuckles of both hands, a severe cystitis, diarrhoea, extensive ulceration of the mouth and inflammation of the genital mucous membrane. [The end of this case is not recorded.] The authors lay stress on the fact that these two patients did not belong to the poverty stricken class. [Not a word is said as to whether they took a good diet or not, or whether they gained or lost weight, though they belong exactly to the type of patients who are likely to have lived on insufficient diet.]

F. M. S.

Babcock (J. W.). **Medico-Legal Relations of Pellagra.**—*Southern Med. Jl.* 1914. Oct. 1. Vol. 7. No. 10. pp. 771–778.

The author, who writes from the double standpoint of a mental specialist and of the chief pioneer of pellagra discovery in the United States, says that it was Legrand du Saulle in 1862 in France who first directed attention to the irresistible impulses towards homicide and suicide from which some pellagrins suffer. The author says that this side of the question has not attracted much attention yet in America, but from press clippings in a Government office he is enabled to give a long list of threatened or successful homicides, suicides, self-mutilations and delusions of the lying-in-state among non-pregnant women. Every reader of pellagra literature must know how common it is for patients to think they will rid themselves of burning sensations in the skin, throat or stomach by jumping into a cool stream or well. [In Egypt, during 1913, there were six murders committed by lunatics at large and four of them were undiagnosed cases of pellagra. Pellagra is now the greatest cause of insanity in Egypt and of deaths among the insane. It accounts for over 17 per cent. of the admissions and one third of the deaths in the Government Asylum.]

F. M. S.

Mitchell (J. A.). **A Case of Pellagra in a Transkeian Native.**—*S. African Med. Record.* 1914. Oct. 10. Vol. 12. No. 19. pp. 341–342.

The patient was originally thought, soon after entry to a convict prison in 1911, to be suffering from scurvy and spongy gums. Two years later he was admitted to hospital with "large blebs on both hands, including fingers and thumbs," and partial hemiplegia and macular patches which caused his case to be diagnosed as anaesthetic leprosy. In December 1913, when he was first seen by the author, he had "partial paralysis of the muscles of the extremities" and scaly dermatitis of face, feet, legs, forearms and back. The patches were anaesthetic, the legs were completely anaesthetic below the knees and the upper limbs anaesthetic for the lower two thirds. There was rhinitis, with much nasal discharge, necrosis of bone, and foul breath, but no leprosy bacilli could be found in smears from the nasal secretion. In January "the hands were completely flaccid and paralysed, with complete wrist drop and wasting of the hand muscles."

Thereupon the Kaffir was found by three doctors to be suffering from pellagra. [It is not stated why the diagnosis of leprosy was abandoned.]

F. M. S.

Rubinato (Giovanni). **Alcuni Casi di Pellagra con Sindrome Addisoniana.** [Some Cases of Pellagra presenting Symptoms of Addison's disease.]—*Riv. Crit. di Clin. Med.* 1914. Jan. 31. Vol. 15. No. 5. pp. 65–74.

An account of four cases of pellagra in which there was bronzing of the skin and great prostration in addition to the other symptoms of pellagra. Three of the patients lost these symptoms after treatment in hospital, but the fourth one died. An exhaustive account is given

of the post mortem appearances in the fatal case. The suprarenals were found to be enlarged and fibrous with a certain amount of hypertrophy of the cellular elements, but as far as can be judged from the description given the appearances were not those seen in genuine Addison's disease. The complication is discussed at length.

J. B. N.

Box (Charles R.). **English Pellagra in early Childhood.**—*Brit. Med. Jl.* 1914. Aug. 29. p. 397. With 2 figs.

This case is interesting because the eruption occurred in a child, in Yorkshire, at the age of 20 months, and appeared again during the spring months of three successive years. There were also mental irritability, disturbed sleep, incontinence of urine and pronounced tremor of hands, arms and head, with occasional small jerky movements of the limbs. Maize flour had never formed part of the diet, "which appeared suitable for her age." The child was suckled for the first year of life and the mother is said to have been strong and healthy.

F. M. S.

Little (E. G. Graham). (i) **Pellagra with Skin Eruptions.**—*Proc. R. Soc. Med.* (Dermatological Section). 1914. July. Vol. 7. No. 9. pp. 238–244. With 2 coloured plates & 1 chart.

(ii) **Case of Pellagra with Skin Eruptions.**—*Brit. Jl. Dermatology.* 1914. Aug. Vol. 26. No. 8. (No. 310). pp. 313–319.

This is another English case which the reviewer had the opportunity of seeing with the author at St. Mary's Hospital. The patient suffered originally from diarrhoea, pleurisy with effusion, and enlarged mesenteric glands, so that he was believed to be tubercular at the age of 16, and was treated at home on a plentiful diet with fresh air and rest.

When admitted to the hospital he was suffering from multiple peripheral neuritis, wrist drop, foot drop, palsy of diaphragm and absence of all deep reflexes except jaw-jerk, transient lateral nystagmus, oedema of legs, dilatation of heart, pulse 156 and a tricuspid murmur. He had peculiar walnut-coloured pigmentation of the back of the hands and wrists and similar patches on the neck, forehead, and nose, while there was deep pigmentation of the penis, scrotum and sacrum. A year before admission and before the onset of the diarrhoea he was "stung by some fly, not identified, on the shoulder and scrotum," while bathing in the river.

F. M. S.

Voegtlin (Carl). **The Treatment of Pellagra.**—*Jl. Amer. Med. Assoc.* 1914. Sept. 26. Vol. 63. No. 13. pp. 1094-1096.

The Professor of Pharmacology to the United States Public Health Service reminds us that mild cases of pellagra will get well in a short time if they are treated in hospital with rest and a liberal mixed diet, containing plenty of fresh meat. Even cases complicated by diarrhoea should not have their diet reduced, "as it has been found through metabolic studies that the assimilation of the food is

unimpaired in this condition." He bewails the fraudulent advertisements of proprietary pellagra medicines throughout the Southern States, each promising positively to cure pellagra. Some of these mixtures, analysed at the Hygienic Laboratory, were found to contain charcoal, iron or quinine, and were sold at exorbitant prices. He believes that pellagra is a chronic intoxication, possibly associated with the large amounts of soluble aluminum compounds which are present in vegetables. In a footnote he draws attention to Alessandrini and Scala's paper reviewed on p. 58 of this *Bulletin*. He sums up the points which require investigation as regards etiology of pellagra as follows :—

"1. A deficiency or absence of certain vitamins in the diet.

"2. The toxic effect of some substances, as aluminum, which occur in certain vegetable food.

"3. A deficiency of the diet in certain amino-acids."

F. M. S.

Lorenz (W .F.). **The Treatment of Pellagra. Clinical Notes on Pellagrins receiving an Excessive Diet.**—*U.S. Public Health Rep.* 1914. Sept. 11. Vol. 29. No. 37. pp. 2357–2360.

A ward of coloured female pellagrins in the Georgia State Sanitarium was placed under the author's supervision for eight weeks. He treated by diet alone and without arsenic or other tonics 27 acute cases of pellagra ; 7 died, 3 were unchanged, 13 improved, and 4 recovered, so that all pellagrous symptoms had disappeared and the mental condition had cleared up entirely. Two of the seven fatal cases were complicated by heart disease and one had phthisis in addition ; two others were unusually severe, " with extensive sloughing of the skin involved and severe stomatitis, salivation and persistent diarrhoea." The excessive diet consisted chiefly of two to four eggs, a quarter of a pound of fresh beef (twice a day), fresh vegetables, 16 ounces of milk, besides milk with coffee and porridge and extra milk between meals whenever the patient desired a drink. An improvement was seen in about four weeks, mental and nervous symptoms changed, bowel conditions improved, diarrhoea was not aggravated, and the skin manifestations were the last to disappear. Some of the insane patients required considerable urging to take this unaccustomed liberal diet. [This experiment would have met with even greater success if the patients had not been insane and had not been so acutely ill.]

F. M. S.

Goldberger (Joseph), Waring (C. H.) & Willets (David G.). **The Treatment and Prevention of Pellagra.**—*U.S. Public Health Rep.* 1914. Oct. 23. Vol. 29. No. 43. pp. 2821–2825.

These Government officials have made up their minds that pellagra is neither infectious nor contagious, but is essentially of dietary origin and " that it is dependent on some yet undetermined fault in a diet in which the animal or leguminous protein component is disproportionately small and tbe non-leguminous vegetable component disproportionately large." In confirmation of their emphatic statement

they point out that no man in the United States or Italian Army has developed pellagra, unless he had it before enlisting. [It is believed that this is also true of the Egyptian Army.] They allow that pellagra is not a disease of mal-nutrition, provided that this term be used as defining some degree of starvation. But recent studies, which have definitely established beriberi as a "deficiency" disease have opened up new possibilities with regard to the etiology of pellagra. In answer to enquiries they recommend that pellagrins should be fed (if necessary by tube) on an abundance of fresh milk, say two pints, four eggs daily, half a pound of fresh lean beef, beans and peas, which must be fresh or dried and not preserved in tins. They emphasize that diarrhoea is no contra-indication to the full feeding. It is advised that no maize products should be given, and that a reduction of carbohydrates may be advisable. Patients in the acute stage should be protected from the sun. But the important thing is "to correct the dietary eccentricity of the affected individual."

In lunatic asylums, where the diet prescribed is often ample, it is of the highest importance to see that the individual patient actually eats the food provided. The authors state from personal observation that some inmates do not eat the food on their plates, either as a consequence of their delusions or because other inmates steal it. [This is a very valuable paper, which should be widely read.]

F. M. S.

Wilson (W. T.). **Preliminary Report of 20 Cases of Pellagra treated with Picric Acid.**—*Med. Bull. of the Harris County Med. Soc.* 1914. July. Vol. 7. No. 2. pp. 24–25.

The author knows of 35 cases, mostly negresses, who are undergoing this treatment in Texas. Some have lost all symptoms in periods varying from 30–50 days, others have only been under treatment for two or three weeks and are said to be "improving." The first case was only treated on May 4th 1914. But there was one negress, age 28, who began treatment on June 20th with eruption, and symptoms referred to mouth and intestines and "mind affected." Yet 17 days later the notes say "no symptoms, mind normal 7 days."

The rash is treated with gauze, soaked in a saturated solution of picric acid, and a weak solution is used as a gargle and administered internally, and no toxic effects were noticed. The author also wishes to know if any other pellagrins have been bitten by a spider, because in two of his patients with this history pellagra appeared within 14 days!

F. M. S.

Robinson (Roy F.). **Treatment of Pellagra.**—*Kentucky Med. Jl.* 1914. Sept. 15. Vol. 12 No. 18. p. 578.

The author says, "believing this to be a protozoal disease, I decided to use bichloride of mercury externally." In three weeks the dermatitis of 13 cases had practically disappeared, but for two additional weeks the drug was also given internally and then the diarrhoea also vanished.

[The merit of this paper is its brevity.]

F. M. S.

Kozovsky (A. D.). **Sur la Morphologie du Sang dans la Pellagre.**— *Nouvelle Iconographie de la Salpêtrière.* 1914. Mar.-Apr. Vol. 7. No. 2. pp. 94–102.

The author writes from the laboratory of the Bessarabia Government Lunatic Asylum at Kostingeni, and has examined the blood of 21 pellagrins, without mental symptoms, in neighbouring villages and 31 insane pellagrous patients in the asylum. He gives no figures as the result of his labour, contenting himself with noting, for instance, that Case 11 showed "large mononuclears, Fürex cells and leucocytes with vacuoles." He finds that large and small lymphocytes are in greater number in insane than in sane pellagrins; he did not find any eosinophiles and in some instances he found many mast cells. In the spleen of one fatal case he found bacilli and cocci which he thinks resembled those described by Tizzoni.

F. M. S.

Rivista Pellagrologica Italiana. 1914. Sept. Vol. 14. No. 5. pp. 69–70. **Una Proposta del Profr. Devoto.** [A Proposal by Professor Devoto].

A proposal that at the coming Pellagrological Congress at Verona, in 1915, there should be an exhibition of as many cases as possible of pellagra in which alimentation with maize can be definitely excluded as the cause of the disease, for examination by the experts present. The proposal is warmly supported by the Editor of the Review.

J. B. N.

Book Review.

Wu Lien-Teh (G. L. TUCK) [M.A., M.D., B.C.]. [Edited by]. **North Manchurian Plague Prevention Service Reports (1911-1913).**— vi+187 pp. With 1 map, 4 charts & 23 plates. 1914. Cambridge: at the University Press. [Price 10/6 net.]

These collected reports include the First Report of the North Manchurian Plague Prevention Service, dealing with the Tarbagan (*Arctomys bobax*) and its relation to plague, which has been already noticed in this *Bulletin* [see Vol. 3, p. 202].

With regard to the progress of the work of the service, the chief points noted in the Annual General Report are (*a*) the establishment of the central office for the transaction of the administrative work of the service in the Customs building, Harbin; (*b*) the opening of the Harbin Isolation Hospital for treatment of patients; (*c*) the completion and opening of the Lahasusu and Sansing Hospitals; and (*d*) the progress towards completion of the Taheiho Hospital.

The fourth report deals with the histology of pneumonic plague. [The material available for examination was very scanty and its examination does not appear to have thrown much new light on the pathology of pneumonic plague.] The examinations of the various organs appeared to afford evidence of an extremely acute septicaemic condition, but the lung lesions were far less marked than was expected, although the presence of lobular pneumonia was clearly indicated. Acute bronchitis accompanied by collapse of lung tissue and catarrhal pneumonia was in evidence, and many of the alveoli were emphysematous or distended with a coagulated albuminous fluid. No evidence of the fibrinous pleuro-pneumonia described by other authors was present in the specimen examined, and the suggestion is made that the latter condition may indicate the presence of a primary pneumonia induced by massive infection, while the catarrhal pneumonia with bronchitis followed by oedema may be the result of a secondary pneumonia from septicaemic infection.

A large portion of the remaining Reports is devoted to administrative details, and include the Quarterly Reports and the Reports of the Harbin Hospital.

R. St. J. B.

TROPICAL DISEASES BUREAU LIBRARY.

Journals.

The following periodicals are received in the Bureau Library.

Note.—The date and volume number following the title indicate the earliest volume of the series which the library possesses. Dashes after the date and volume number indicate that the intervening parts (unless otherwise stated) are complete to the date of publication of this list.

Series which are complete from the commencement are marked with an asterisk.* Some of the foreign journals are not up to date.

EUROPE.

Great Britain.

*Annals of Tropical Medicine & Parasitology (Liverpool)	1907—	Vol. 1—
British Medical Journal (London)	1876—	
*Bulletin of Entomological Research (London)	1910—	Vol. 1
Edinburgh Medical Journal	1908—	(New ser.) Vol. 1—
Glasgow Medical Journal	1909	Vol. 71—
Journal of the Board of Agriculture (London)	1913—	Vol. 20—
Journal of Comparative Pathology & Therapeutics (Edinburgh & London)	1908—	Vol. 21 —
*Journal of Hygiene (Cambridge)	1901—	Vol. 1—
*Journal of the London School of Tropical Medicine (London)	1911–13	Vol. 1–2 [Publication ceased]
Journal of Pathology & Bacteriology (Cambridge)	1907—	Vol. 12—
*Journal of the Royal Army Medical Corps (London)	1903—	Vol. 1—
Journal of State Medicine (London)	1913—	Vol. 21—
*Journal of Tropical Medicine & Hygiene (London)	1898—	Vol. 1—
*Lancet (London)	1888—	
*Lister Institute. Collected Papers (London)	1904—	Vol. 1—
*Parasitology (Cambridge)	1908—	Vol. 1—
Proceedings of the Royal Society, Series B. (London)	1905—	Vol. 76—
Public Health (London)	1908—	Vol. 22—
*Reports of the Sleeping Sickness Commission of the Royal Society (London)	1903—	No. 1—
*Review of Applied Entomology. Series A : Agricultural. Series B : Medical & Veterinary (London)	1913—	Vol. 1—
*Transactions of the Society of Tropical Medicine & Hygiene (London)	1907—	Vol. 1—
Veterinary Journal (London)	1909—	Vol. 65—
Veterinary News (London)	1910—	Vol. 7—
Veterinary Record (London)	1913—	Vol. 26—
*Yellow Fever Bureau Bulletin (Liverpool)	1911—	Vol. 1—

FRANCE.

*Annales d'Hygiène et de Médecine Coloniales (Paris)	1898—	Vol. 1—
Annales de l'Institut Pasteur (Paris)	1897—	Vol. 11—
Archives de Médecine et Pharmacie Militaires (Paris)	1914—	Vol. 63—
Archives de Médecine et Pharmacie Navales (Paris)	1907—	Vol. 88—
*Archives de Parasitologie (Paris)	1898—	Vol. 1—
Bulletin de l'Institut Pasteur (Paris)	1909—	Vol. 7—
*Bulletin de l'Office International d'Hygiène Publique (Paris)	1909—	Vol. 1—
*Bulletin de la Société de Pathologie Exotique (Paris)	1908—	Vol. 1—
Bulletins et Mémoires de la Société Médicale des Hôpitaux de Paris	1913—	(3 ser.) Vol. 29—
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Gazette des Hôpitaux Civils et Militaires (Paris)	1914—	Vol. 87—
Recueil de Médecine Vétérinaire (Alfort)	1913—	Vol. 90—
Répertoire de Police Sanitaire Vétérinaire (Paris)	1913—	Vol. 29—
*Revue de Médecine et d'Hygiène Tropicales (Paris)	1904—	Vol. 1—
Revue Générale de Médecine Vétérinaire (Lyons)	1913—	Vol. 21—
Revue Vétérinaire (Toulouse)	1913—	Vol. 38—

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Arbeiten aus dem Kaiserlichen Gesundheitsamte (Berlin)	1913—	Vol. 43—
Archiv für Protistenkunde (Jena)	1913—	Vol. 30—
*Archiv für Schiffs- und Tropen-Hygiene [& Beihefte] (Leipzig)	1897—	Vol. 1—
Berliner Tierärztliche Wochenschrift	1914—	Vol. 30—
Centralblatt für Bakteriologie (Jena)		
1. Abteilung. Originale	1912—	Vol. 65—
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Deutsche Medizinische Wochenschrift (Berlin)	1909—	Vol. 35—
Deutsche Militärärztliche Zeitschrift (Berlin)	1910—	Vol. 39—
Deutsche Tierärztliche Wochenschrift (Hanover)	1913—	Vol. 21—
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*Zeitschrift für Chemotherapie und Verwandte Gebiete. 1. Teil., Originale (Leipzig)	1912—	Vol. 1—
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*Zeitschrift für Immunitätsforschung und Experimentelle Therapie (Jena)	1908—	Vol. 1—
Zeitschrift für Veterinärkunde (Berlin)	1913—	Vol. 25—

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Annali d'Igiene Sperimentale (Turin)	1912—	Vol. 22—
Annali di Medicina Navale e Coloniale (Rome)	1908—	Anno 14—

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Atti della Società per gli Studi della Malaria (Rome)	1907–1909—	Vols. 8, 10—
*Annali della Stazione Sperimentale per le Malattie Infettive del Bestiame (Naples)	1911—	Vol. 1—
Bollettino delle Sedute della Accademia Gioenia di Scienze Naturali in Catania	1911—	Part 19—
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Das Oesterreichische Sanitätswesen (Vienna)	1913—	Vol. 25—
Wiener klinische Wochenschrift ..	1913—	Vol. 26—

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Archives des Sciences Biologiques (St. Petersburg)	1914—	Vol. 15—

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Annales de Médecine Vétérinaire (Ixelles-Brussels)	1913—	Vol. 62—
Bulletin de l'Académie Royale de Médecine de Belgique (Brussels) ..	1908—	(4 ser.) Vol. 22 —

HOLLAND.

Janus (Leyden)..	1909—	Vol. 14—
*Folia Microbiologica (Delft)	1912—	Vol. 1 —

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Boletin del Instituto Nacional de Higiene de Alfonso XIII (Madrid) ..	1913—	Vol. 9. No. 33—

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*Archivos de Hygiene e Pathologia Exoticas (Lisbon)	1905—	Vol. 1—
*Archivos do Instituto Bacteriologica Camara Pestana (Lisbon)	1906—	Vol. 1—
*Bulletin de la Société Portuguaise des Sciences Naturelles (Lisbon) ..	1907—	Vol. 1—
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Archives de Médecine (Athens) ..	1911—	Vol. 7—
La Grèce Médicale & Ἰατρικὴ Πρόοδος (Athens)	1912—	Vol. 14—

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*Canadian Medical Association Journal (Toronto)	1912—	Vol. 1—

UNITED STATES.

*American Journal of Public Health (New York)	1911—	Vol. 1—
*American Journal of Tropical Diseases and Preventive Medicine (New Orleans)	1913—	Vol. 1—
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*American Society of Tropical Medicine	1904—	Vol. 1—
*Archives of Internal Medicine (Chicago)	1908—	Vol. 1—
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*Collected Studies from the Research Laboratory Department of Health, City of New York	1906—	Vol. 1—
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Journal of the American Medical Association (Chicago)	1910—	Vol. 54—
Journal of Cutaneous Diseases including Syphilis (New York)	1913—	Vol. 31—
*Journal of Economic Entomology (Concord)	1908—	Vol. 1—
*Journal of Experimental Medicine (New York)	1896—	Vol. 1—
*Journal of Infectious Diseases (Chicago)	1904—	Vol. 1—
*Journal of Parasitology (Urbana) ..	1914—	Vol. 1—
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New Orleans Medical & Surgical Journal	1912—	Vol. 65—
New York Medical Journal	1910—	Vol. 91—
*Proceedings of the Society for Experimental Biology and Medicine (New York)	1903—	Vol. 1—

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Proceedings of the United States National Museum (Washington) ..	1879—	[Incomplete]
Public Health Reports (Washington)	1909—	Vol. 24—
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Southern Medical Journal (Nashville, Tenn.) (1911, 1912 incomplete)	1913—	Vol. 6—
Studies from the Zoological Laboratory, University of Nebraska	1909—	
*Texas State Journal of Medicine (Fort Worth)..	1905—	Vol. 1—
United States Naval Medical Bulletin (Washington)..	1909—	Vol. 3—
*United States War Department Bulletin (Washington)	1913—	No. 1—
University of California (Berkeley):		
Publications in Pathology	1903—	Vol. 1—
Publications in Zoology	1908—	Vol. 6—
University of Kansas:		
Science Bulletin (Lawrence).. ..	1913—	

CENTRAL AMERICA.

Anales del Instituto Médico Nacional (Mexico)	1905—	Vol. 6—
Canal Record (Balboa, C.Z.)	1912—	Vol. 6—
Cronica Medica Mexicana	1914—	Vol. 17—
*Proceedings of the Canal Zone Medical Association (Mount Hope, C.Z.) ..	1908—	Vol. 1—

SOUTH AMERICA.

Archivos Brasileiros de Medicina ..	1914—	Vol. 4—
*Boletim da Sociedade Brasileira de Dermatologia	1912—	Vol. 1—
Brazil-Medico	1914—	Vol. 28—
La Cronica Medica (Lima)	1914—	Vol. 31. No. 605—
Gaceta Medica de Caracas	1914—	Vol. 21—No. 16 —
*Memorias do Instituto Oswaldo Cruz (Rio de Janeiro-Manguinhos) ..	1909—	Vol. 1—
Revista Medica de S. Paulo (S. Paulo)	1912—	Vol. 15—
Revista Medica de Yucatan	1913—	Vol. 7—

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INDIA.

*Indian Journal of Medical Research (Calcutta)	1913—	Vol. 1—
Indian Medical Gazette (Calcutta)	1894–1908	Vols. 29–43 [Incomplete]
	1909—	Vol. 44—
Medical Missions in India (Pokhuria)..	1912—	Vol. 18—
*Memoirs of the Department of Agriculture in India. Veterinary Series (Calcutta)..	1913—	Vol. 1—
*Paludism (Simla)	1910–1912	Nos. 1–5 [Publication ceased]
*Scientific Memoirs by Officers of the Medical & Sanitary Departments of the Government of India (Calcutta)	1902—	(New ser.) No. 1—

JAPAN.

Sei-i-Kwai Medical Journal	1913—	Vol. 32—

CHINA.

China Medical Journal (Shanghai) ..	1912—	Vol. 26—

EAST INDIAN ARCHIPELAGO.		
Geneeskundig Tijdschrift voor Nederlandsch-Indië (Rijswijk-Batavia) ..	1901—	Vol. 41—
*Mededeelingen van den Burgerlijken Geneeskundigen Dienst in Nederlandsch-Indië..	1912—	Vol. 1—
*Philippine Journal of Science, Section B. Philippine Journal of Tropical Medicine (Manila)	1906—	Vol. 1—
INDO-CHINA.		
Bulletin de la Société Médico-Chirurgicale de l'Indochine (Hanoi & Haiphong)	1910—	Vol. 1—[Vol. 2 incomplete]
AFRICA.		
*Archives de l'Institut Pasteur de Tunis	1906—	Vol. 1—
Medical Journal of South Africa [formerly Transvaal Medical Journal] (Johannesburg)	1913—	Vol. 9—
*Nyasaland Sleeping Sickness Diary (Zomba)	1908—	No. 1—
Records of the Egyptian Government School of Medicine (Cairo).. ..	1904—	Vol. 2—
Revue Médicale d'Alger	1914—	Vol. 2—
Rhodesia Agricultural Journal (Salisbury)	1915—	Vol. 11. No. 8—
South African Medical Record (Cape Town)..	1910—	Vol. 8—
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Bulletin de la Société Médicale de l'Ille Maurice	1908	(2 ser.) Nos. 14–22— (3 ser.) No. 23—
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Australasian Medical Gazette (Sydney)	1913—	Vols. 33–35 [Publication ceased]
Australian Medical Journal (Melbourne)	1913—	(New ser.) Vols. 1–3 [Publication ceased]
*Medical Journal of Australia (Sydney)	1914—	Vol. 1—
NEW ZEALAND		
New Zealand Medical Journal.. ..	1913—	Vol. 12. No. 45—

NOTE.—The Director would consider proposals for the exchange of the Bureau publications with other medical and scientific journals in which original papers on tropical diseases or parasitology are published.

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Works in the Bureau Library may be consulted between 10 and 5.

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The Director will be glad to receive early copies of works or reprints on Tropical Diseases for notice in the *Bulletin* and for the Library. To be addressed—Tropical Diseases Bureau, Imperial Institute, London, S.W.

(Telephone:—Kensington, 5188.)

Reprints have been received from:—

BRUMPT (Professor E.) & GOMES (Professor J. F.); CHALMERS (Dr. A. J.); FLU (Dr. P. C.); LAVERAN (Professor A.); SCOTT (Dr. H.); STEPHENS (Professor J. W. W.); WILSON (Dr. W. T.).

BOOKS RECEIVED.

CRAIG (Charles F.). The Prophylaxis of Malaria with Special Reference to the Military Service.—*U.S. Army War Department, Office of the Surgeon General. Bulletin No. 6.* 1914. Aug. 115 pp. With 11 plates and 3 charts.

HINDLE (Edward) [B.A., Ph.D.]. Flies in Relation to Disease. Blood-sucking Flies.—xv+398 pp. With 88 text-figs. Demy 8vo. 1914. Cambridge: at the University Press. [Price 12/6 net].

INDIAN SANITARY POLICY, 1914. Being a Resolution issued by the Governor General in Council on the 23rd May, 1914.—42+iv pp. Demy 8vo. 1914. Calcutta: Supt. Govt. Printing, India. [Price 6 Annas.]

UNITED STATES WAR DEPARTMENT. Report of the Surgeon General U.S. Army for the Fiscal Year ended June 30, 1914.—306 pp. With 27 charts and 2 maps. 1914. Washington: Govt. Printing Office.

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